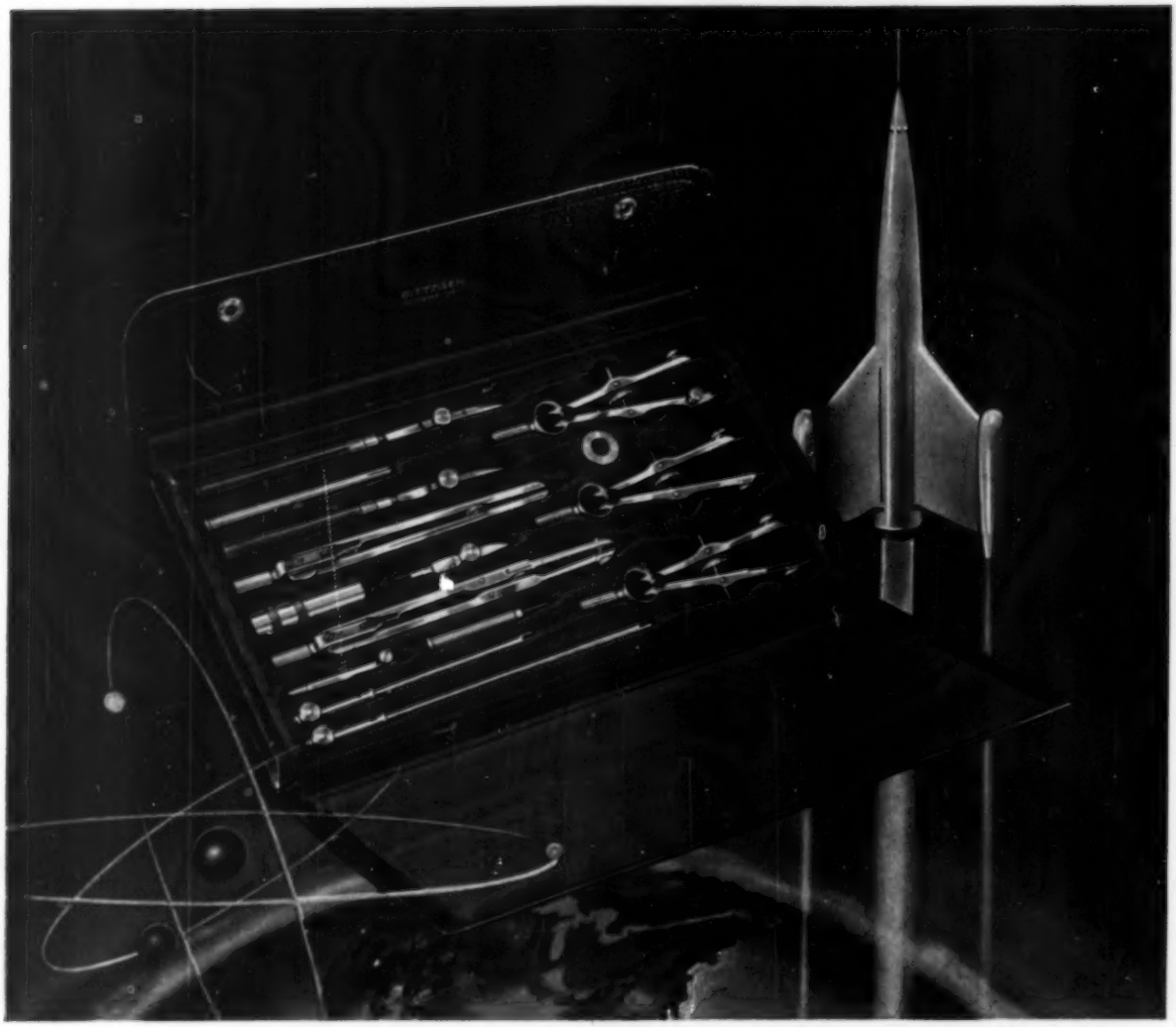
February Vol. 46 No. 2

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine



THE NATION'S NEED IN ENGINEERS

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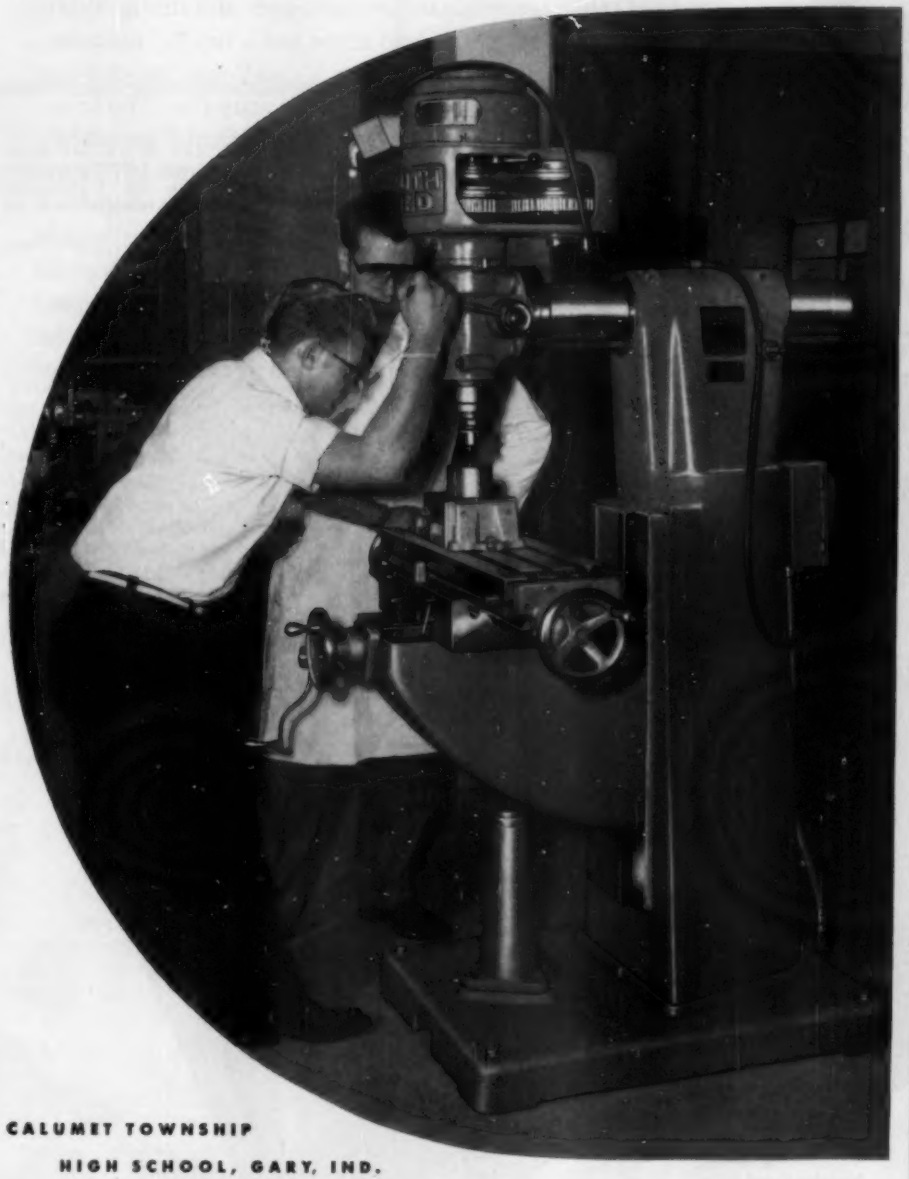

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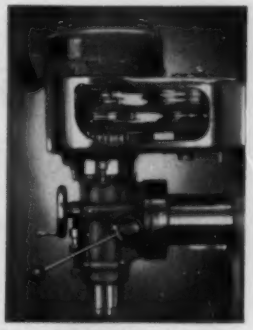

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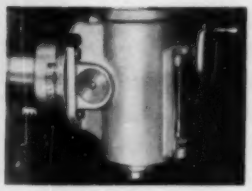

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FEBRUARY
1957

VOL. 46 NO. 2

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

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☆ ☆ ☆

This Month's Cover

The cover picture on this issue shows two students in Dr. Herbert A. Anderson's woodworking class performing one of the operations required in the lamination of water skis as they tighten the clamps on a special forming jig.

The photograph was taken by Raymond Johnson, graduate student, Stout State College, Menomonie, Wis.

Submitted by D. P. Barnard, director of audio-visual education.

☆ ☆ ☆

American Heart Association

The annual February Heart Fund campaign enlists your aid in the vital work of combating diseases of the heart and circulation through research, professional and public education, and community heart programs.

Heart Sunday is to be observed on February 24. The Heart Fund campaign, which begins on February 1, will continue through February 28.

☆ ☆ ☆

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Subscription Information.—Subscription price in the United States, U.S. possessions, and Canada, $3.75 a year, payable in advance. In all foreign countries, $4.25. Single copies 50 cents. March School Shop Annual, $1.00.

Discontinuance.—Notice of discontinuance of subscription must reach the Publication Office in Milwaukee, at least fifteen days before date of expiration. Notices of changes of address should invariably include the old as well as the new address. Complaints of non-receipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

Editorial Contributions.—The Editor invites contributions bearing upon Industrial Arts, Vocational Education, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for upon publication. In all cases manuscripts should be accompanied by full return postage.

Articles Indexed.—The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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Association News

COMING CONVENTIONS

March 14–16. New Jersey Vocational and Arts Association, at Berkeley Carteret Hotel, Asbury Park, N. J. Secretary, Richard O. Harthmann, 63 Lexington Ave., Jersey City, N. J.

Mar. 21–23. Ohio Industrial Arts Association, at Neil House Hotel, Columbus, Ohio. Secretary, C. R. Hawes, 629 Sweitzer St., Greenville, Ohio.

THE 1956 ST. LOUIS AVA CONVENTION

The Golden Anniversary Convention of the American Vocational Association was held at St. Louis, Mo., December 3 to 7, 1956. Outstanding at this convention was the distribution of the Golden Anniversary Number of the American Vocational Journal which commemorates the fiftieth year of the purposeful pursuance of industrial-vocational education.

The American Vocational Association is the outgrowth of the National Society for the Promotion of Industrial Education founded in 1906. The name of this organization was changed in 1918 to the National Society for Vocational Education.

Another association formed as a regional group having vocational education in mind was organized in 1914 under the name of The Vocational Association of the Middle West.

The two groups mentioned above merged and formed the American Vocational Association incorporated in 1929 with headquarters in Washington, D. C.

The 1956 convention in St. Louis fully and drastically reflected the progress that has been made in vocational education during the past half century. The roster of those who contributed to the Golden Anniversary Number reads like a veritable *Who's Who* in industrial arts and vocational education. The large number of 2800 or more of our educators who attended from all parts of our country, from Canada, Puerto Rico, and Mexico, attest to the deep interest that educators and others have in industrial arts and vocational education. The 95 or more commercial exhibitors also show that business and industry are aware of the great value which our field of education exerts in the education of our youth. This huge exhibit gave the visitors a real chance to get an overview of the tools, equipment, materials, texts and project books, related materials, and teaching aids that are available to those who conduct the industrial arts and vocational classes in agriculture, business, distributive education, home economics, industrial arts, rehabilitation, technical education, vocational guidance, and teacher education.

It is very difficult to give a real account which fully covers all that transpired at St. Louis during the convention.

Special meetings were held by the National Association of State Directors of Vocational Education on Monday and Tuesday, December 3 and 4, at which an analysis of new legislation was made, and legislation affecting the further development of vocational education was studied.

Accreditation and evaluation of vocational education also was discussed.

Ralph Howard, Ohio State Director of Vocational Education, was elected president of the National Association of State Directors of Vocational Education at the AVA convention at St. Louis.

Industrial Arts Education

The Wednesday afternoon session of the Industrial Arts section discussed how industrial design techniques can be applied to the school shop. Among those taking part in this program were: John L. Feirer, Herman Zimmerman (sales engineer of the Danly Machine Specialties, Inc., St. Louis, Mo.), Alexander F. Bick, Maurice Overholt, and Paul L. Scherer.

On Wednesday morning H. H. London was chairman at a meeting at which a panel consisting of R. O. Gallington, H. O. Reed, Jack Robb, Ralph K. Watkins, and Ralph C. Wenrich discussed the problem "What Should We Teach in Industrial Arts."

On Thursday afternoon, under the chairmanship of Dewey F. Barich, Harold Foss, director of manufacturing, Engineering Office of the Ford Motor Company, presented an interesting picture of manufacturing practices.

Trade and Industrial Education

At the Sunday meeting, December 2, at 2:00 p.m., under the chairmanship of John A. Jarvis, Professor H. H. London gave a report on the work research committee.

(Continued on page 6A)

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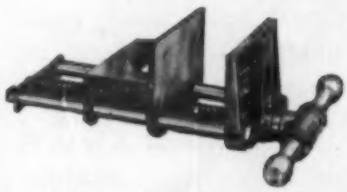

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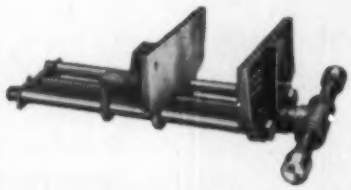

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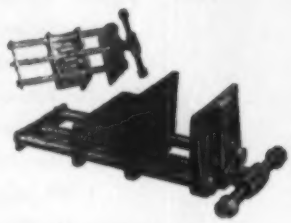

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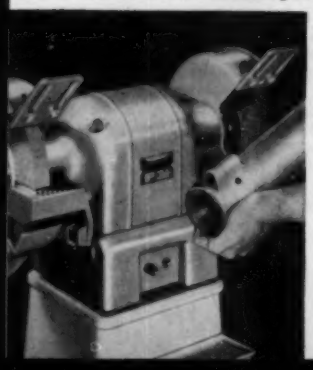

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ASSOCIATION NEWS

(Continued from page 4A)

Rupert N. Evans did likewise on the evaluation committee, and Robert A. Tinkham on the membership committee.

On Monday morning under the chairmanship of Herbert L. Benson the questions, "What is Research," "What is the Industrial Teacher Trainer's Responsibility for Leadership Development," were discussed by Earle L. Canfield and Burr D. Coe.

James R. D. Eddy presented a "Study to Determine the Need for Adult Vocational Education."

"A Study of Apprenticeship" was presented by Clifford G. Dobson and Max Eddy spoke on "Related Instruction Needed by Students in Co-operative Occupational Training."

At one of the section meetings of the industrial teacher education group, with Kermit A. Seefeld as chairman, R. Lee Hornbake spoke on "Industrial Arts in 1970." "Facilities for Industrial Arts in 1970" was presented by M. Ray Karnes; and William J. Micheels spoke on "Industrial Arts Teacher Training in 1970."

Divisional meetings also were held on apprentice training, radio, electronics, and television; supervisory training; automotive training; and graphic arts; industrial co-operative training; and building trades, and metal trades training.

There were scores of breakfast, luncheon, and dinner meetings.

Outstanding among the addresses given at the various general sessions was the one by the Hon. Stuart Symington, U. S. Senator from Missouri. Unfortunately, space is not available to do it justice in this report.

High lights for many who attended the convention were the visits to the new O'Fallon Technical High School, Hadley Technical High School, and the David Ranken Jr. School of Mechanical Trades.

The annual convention banquet was omitted this year. Instead the Ship's program did double duty, and did it outstandingly well. The Ship's citation was given to Emmett O'Brien, state director of vocational education, Hartford, Conn.

The next AVA convention will be held at Philadelphia, Pa., August 5 to 9, 1957.

CENTRAL CONNECTICUT INDUSTRIAL ARTS ASSOCIATION

The Central Connecticut Industrial Arts Association met on December 5 at the Teachers College of Connecticut at New Britain, to conduct a short workshop.

President Harry Arnini, assisted by Edwin Cook and Dr. Thomas Monteleone of the Teachers College staff, planned and led the program which included the following areas and leaders: Photography — David Harris of Bristol; Rubber Stamp Making — George Gaudette, Plainville High School; Internal Plastic Carving — Walter Hutengz, Plainville High School; Wood Finishes — Nelson Lyons, Bristol High School; Electroplating — Dr. Thomas Monteleone, Teachers College; Wire Wheel Wood Finishing — Robert Brady, King Philip Junior High School, West Hartford; Wood Carving — David Merrill of Teachers College; Metal Enameling — John Poen, Newington; Leather Tooling and Carving — Kenneth Beatson of Woodstock Academy.

A short business meeting preceded the workshop, and an informal get-together completed the evening with the presentation of door prizes, and refreshments.

Preliminary plans were made for the 1958 anniversary conference of the Connecticut Industrial Arts Association. — *Russell H. Anderson, Secretary.*

NORTH CAROLINA TEACHERS MEET

The North Carolina Industrial Arts Association held its ninth annual fall business meeting at Rocky Mount, N. C., Saturday, November 3, 1956. There were approximately eighty people present at the meeting.

Neal Atkins and Lee Chapman of the Rocky Mount Senior High School industrial-arts department, served as hosts.

Following the period of registration and the business meeting, a luncheon meeting was held. C. M. Edson, high school principal, welcomed the visitors.

Emil Kronquist, author, teacher, and craftsman, gave a short talk at the luncheon meeting preceding his silversmith demonstration. At the demonstration there were a number of extra guests from Eastern Carolina College. These were students majoring in elementary education and industrial arts, who had come just for the demonstration.

Officers of the Association are: Robert Leith, president; Tom Shore, vice-president; and Marshal Schmidt, secretary and treasurer. — *K. C. Sinclair, Public Relations Chairman.*

FAIRFIELD COUNTY TEACHERS MEET

The members and guests of the Fairfield County Industrial Arts Association held their November 28 meeting in the newly remodeled and renovated Burdick Junior High School, Stamford, Conn. The group was welcomed by Joseph J. Franchina, principal of the school. Added greetings were expressed by Roy Hill, administrative assistant to the Superintendent of Stamford public schools; Elsworth Plumber, director of arts, and Byron

(Continued on page 10A)

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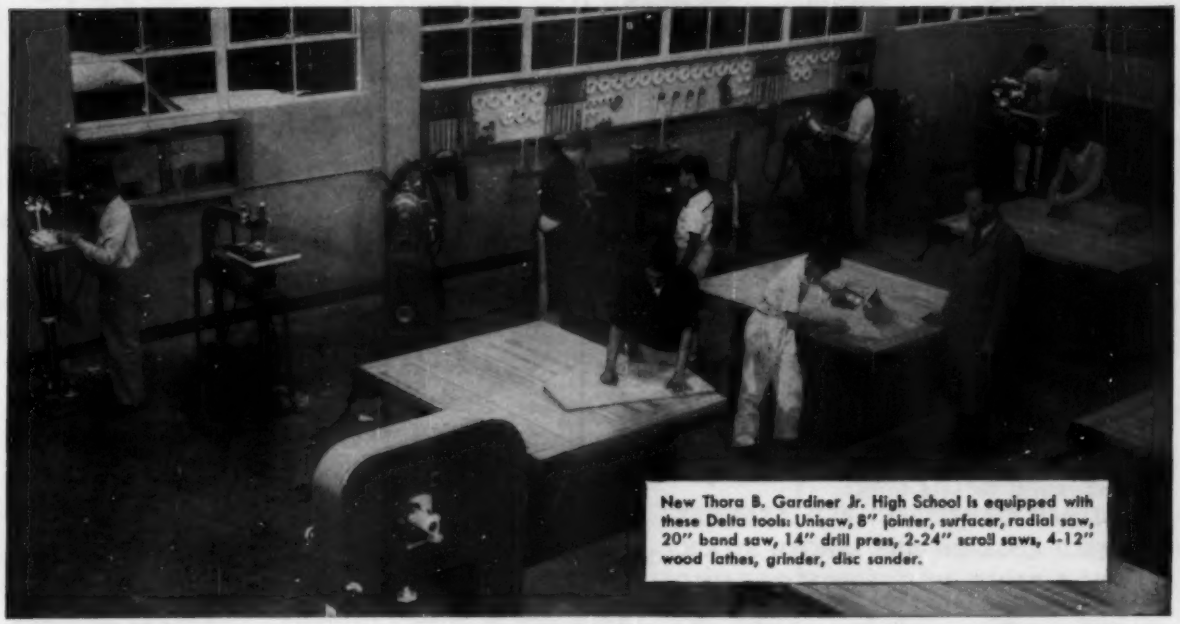

New Thora B. Gardiner Jr. High School is equipped with these Delta tools: Unisaw, 8" jointer, surfacer, radial saw, 20" band saw, 14" drill press, 2-24" scroll saws, 4-12" wood lathes, grinder, disc sander.

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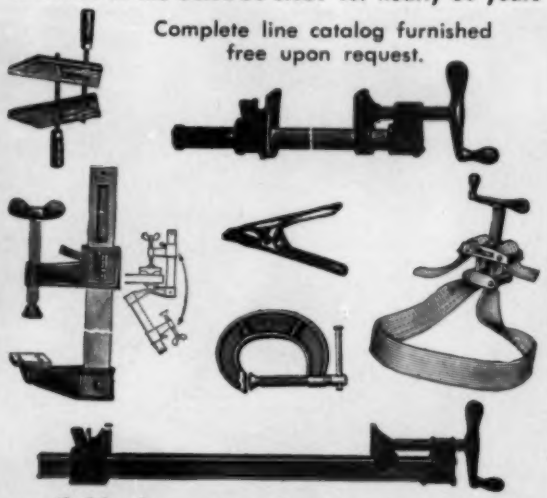

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No. 1010 Dial Indicator Pocket Gage
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No. 86A Combination Hand Vise
No. 596 Pencil Divider
No. 54 Hold Downs
No. 196A Universal Dial Test Indicator
No. 29 Scratch Gage
No. 56A Toolmakers' Surface Gage
No. 172A Thickness Gage
No. 70A Pocket Scribers
No. 500 Steel Pocket Tape, 72 inch
No. 530 Steel Case Tape
No. 711F "Last Word" Dial Test Indicator
No. 50A Improved Trammels
No. 93A T-Handle Tap Wrench
No. 132 Bench Level, six inch
No. 129 Bench Block
No. 236H Depth and Angle Gage
No. 135 Pocket Level
No. 165 Double End Pin Vises
No. 166 Pin Vises
No. 579 Telescoping Gages
No. 185 Tap and Drill Gage
No. 187 Jobbers' Drill Gage
No. 167 Radius Gages
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ASSOCIATION NEWS

(Continued from page 6A)

Berry, assistant supervisor to Mr. Plumber, in charge of industrial arts of Stamford Schools. Mr. Hill expressed the greetings of the superintendent, Reginald Neuwine.

The business meeting was conducted by Association President Ralph Killelea.

John Driscoll, woodworking teacher at the Burdick School, was master of ceremonies.

G. Wesley Ketcham was the main speaker of the evening. He is consultant in industrial arts for the State Department of Education, Hartford. His talk was on "School Shop Safety." A question-and-answer period followed Mr. Ketcham's presentation.

After the business meeting, door prizes were given, and refreshments served.

The February 13 meeting of the association will be held at Staples High School, Westport, Conn., at 7:30 p.m. The April 10 joint meeting with the New Haven County Industrial Arts Association will be held at the Elks Club in West Haven, Conn. — *John J. Burkhardt, Secretary.*

25TH ANNIVERSARY OF VOCATIONAL EDUCATION IN PUERTO RICO

The AVA Puerto Rico Chapter announces the celebration of the silver anniversary of the Vocational Education in Puerto Rico on March 24 to 30, 1957.

INDUSTRIAL TEACHER CONFERENCE

The Ninth Annual Industrial Teacher Conference and the Second Annual Meeting of the Texas Industrial Arts Association will be held on the campus of the A. and M. College of Texas, College Station, Tex., on February 22 and 23, 1957.

Dr. Burl Osburn, head, Industrial Arts Department, State Teachers College, Millersville, Pa., will be the principal speaker.

The program will consist of group discussions, talks, demonstrations, and entertainments. There also will be special sessions for industrial-arts teachers, vocational industrial teachers and members of high school industrial arts clubs. Entertainment will be provided for the ladies.

CENTRAL MINNESOTA MEETING

The Central Minnesota Industrial Arts Association met at New London High School, New London, Minn., on Saturday, December 8, 1956. In the morning the men visited the Steel Tanks Company plant where they saw the making of steel tanks for storage of butane and propane gas.

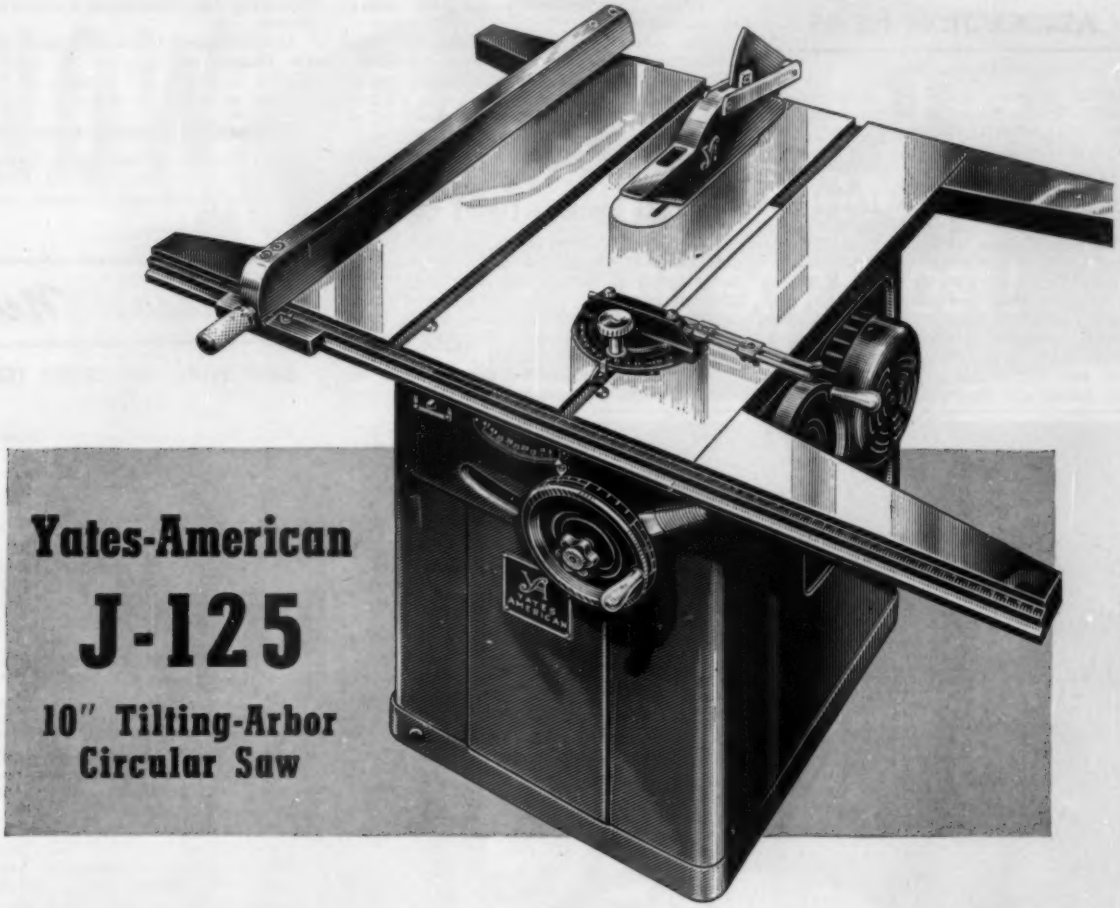
Before lunch a business meeting was held. At this time it was decided that the group would again sponsor a Student Craftsman's Fair. This will be the second year that the Fair has been staged with the co-operation of Ford Motor Company.

The noonday luncheon was followed by a presentation by a design team from the University of Minnesota. New ideas concerning the teaching of design principles in industrial arts were shown. — *Charles Cummer, Publicity.*

ANNUAL SPRING CONFERENCE PLANNED

The Connecticut Industrial Arts Association will hold its Annual Spring Conference on the campus of the Teachers College of Connecticut, New Britain, Conn., on April 12 and 13, 1957. The conference will include talks by educational leaders, commercial exhibits demonstrating newest supplies and equipment in the field, and school exhibits

(Continued on page 12A)



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ASSOCIATION NEWS

(Continued from page 10A)

featuring projects made by industrial-arts students. The highlight of the conference will be an address by Dr. William J. Sanders, the new Commissioner of Education in Connecticut, at the annual banquet to be held on Friday evening in Marcus White Hall.

Cochairmen of the event are Richard Terry of Milford High School, and William F. Riley of Teachers College of Connecticut. The remainder of the conference committee are:

Frank LeSieur, publicity; Carl Hubachek and George Metz, commercial exhibits; Jack Crowe, exhibit co-ordinator; Charles Lyman, commercial prizes; George Gaudette, printing; Ernest Hartz, conference program; Edwin Cook and Pat Corsu, registration; Sanford Rich, sound and photography; Ernest Bono, finances; and G. Wesley Ketcham, educational consultant.

The officers of the Connecticut Industrial Arts Association who will be completing a two-year term are: president, William England; vice-presidents, Edwin Cook, Richard Terry, and William Burns; secretary, Carl Hubachek; treasurer, Ernest Bono; representatives, Lester Roy, James Eisenhaure, and Byron Berry.

CENTRAL DISTRICT ELECTS OFFICERS

The Central District Industrial Arts Association of Arizona has elected its new slate of officers for the coming year. They are as follows: president, William Grissom, Glendale High School; vice-president, Fred Winemiller, Phoenix Schools; secretary-treasurer Ted Olsson, Phoenix Schools.

Clarence Hance, the retiring president, has been elected vice-president of the Arizona Industrial Arts Association, a statewide organization.

Industrial-arts instructors now residing in the Phoenix or Valley of the Sun area, are invited to attend the monthly meetings, and to join as active members.

MISSOURI SPRING CONFERENCE

The Missouri Annual Spring Conference on Industrial Education, will be held at the University of Missouri, Columbia, on April 12 and 13, 1957.

Which is
THE BEST BIT BRACE
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You'll find the answer — according to thousands of school shop instructors — in the famous Millers Falls line.
Possibly you'll prefer the No. 772, an outstanding favorite with generations of expert craftsmen... or the No. 1950 with its unbreakable "Tenite" head and handle... or any one of the other popular models. There are Millers Falls bit braces in every price range.
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Personal News

NEW YORK UNIVERSITY TEACHER ACTIVITIES

Prof. Roland H. Spaulding, Department of Vocational Education, New York University, has just returned from a trip to Puerto Rico where he visited the high schools of that island in a brief survey of the Civil Air Patrol in its relationships with the Department of Education of Puerto Rico.

Dr. Kenneth R. Benson, Department of Vocational Education, New York University, has been elevated to the rank of Assistant Professor, School of Education, effective September 1, 1956.

Dr. Benson, and Dr. Howard Newberger, of the Department of Educational Psychology of New York University, conducted demonstration lectures in the Ossining Public Schools, on November 13, 1956. Dr. Benson demonstrated in three classes dealing with the education of the retarded child, while Dr. Newberger consulted with teachers and administration concerning special problems in the education of the subnormal child.

Dr. Benson attended the International Congress held in Philadelphia, September 1 to 6, 1956. Some eighty countries were represented at this convention. He served as chairman of two meetings concerning the place of arts and crafts in the broad field of recreation. In addition, five students of the Department of Vocational Education demonstrated applicable industrial-arts projects, as these projects are related to recreation. In the field of Hospital Recreation, seven graduate students of the Department of Physical Education and Recreation, under the leadership of Dr. Benson, organized a panel that concerned itself with the place of arts and crafts in the hospital recreation program.

NEW YORK UNIVERSITY GRADUATES

Graduates of The School of Education, New York University, New York City, have been placed in the following industrial-arts positions: Stanley Adler, Elementary Industrial Arts, Uniondale, L. I.; James Benedict, Junior and Senior High, Scarsdale, N. Y.; Marvin Cirieco, Senior High School, White Plains, N. Y.; Howard Cwik, chairman, industrial arts department, Uniondale, L. I.; Anthony DiMarco, Junior High, White Plains; Alvin Greenberg, Public Schools, Cliffside, N. J.; Herbert Horowitz, Jr. and Sr. High, Fairlawn, N. J.; Herschel Merritt, Public Schools, New York City; Edward Milch, Public Schools, White Plains; Charles Stegeman, Public Schools, Long Beach, L. I.; and Warren Zeidman, Children's Village, Dobbs Ferry, N. Y.

A recent New York University Industrial Arts graduate, Henry Sredl, has been appointed to the United States Air Force Academy.

(Continued on page 20A)

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6319 ILLUSTRATED, 1" COLLET CAPACITY. AVAILABLE WITH VARIABLE SPEED DRIVE.

ON ALL MODELS OF

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The medium-size No. 270 is a favorite in school shops

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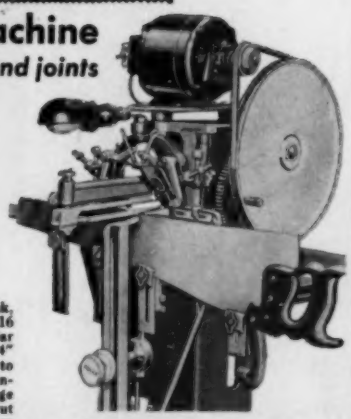

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Specially designed for schools, standard HALLOWELL furniture offers planners an opportunity to fit up complete industrial arts and vocational shops at a fraction of the cost of custom-designed equipment. And the design and construction features, materials and quality are such that this furniture will last for years.

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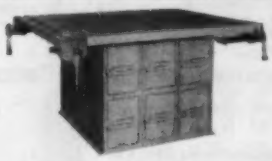
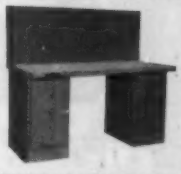


WOODWORKING BENCHES

TOOL STORAGE CABINETS

GLUE BENCHES



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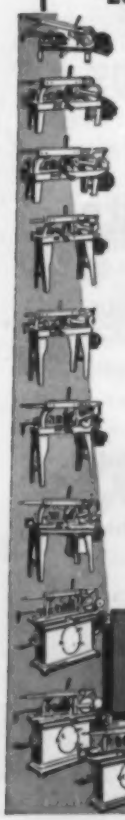

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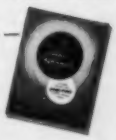

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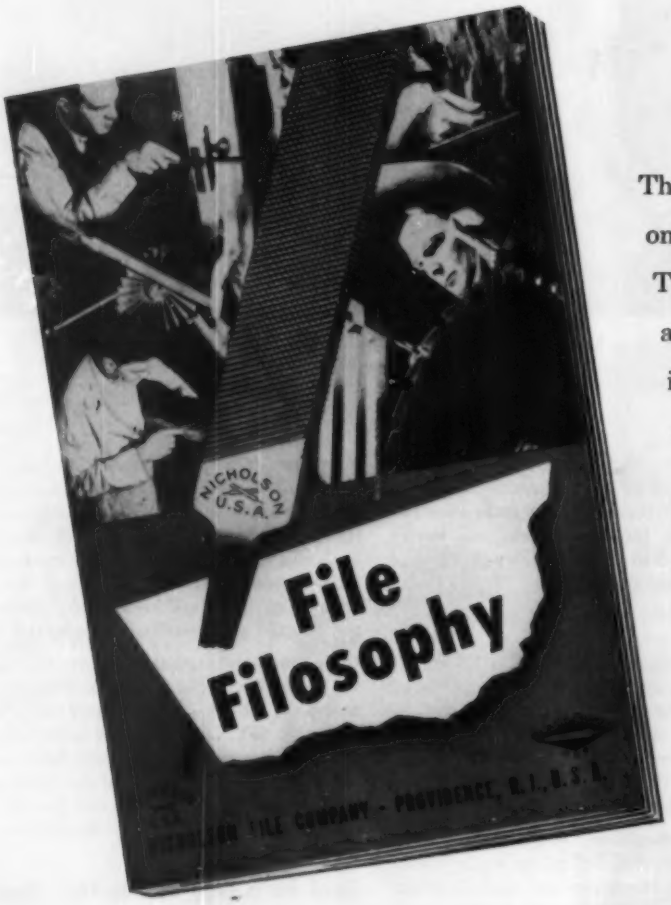

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Industrial Arts and Vocational Education
The Shop Teachers' Professional Magazine
FEBRUARY 1957

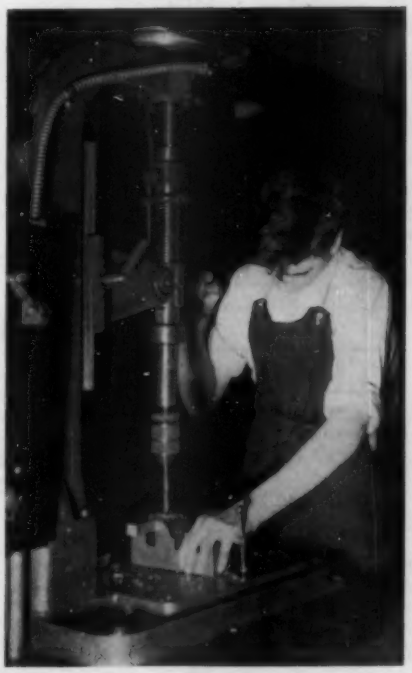
Teachers With Skill and Insight Need for These Courses —

Trade Exploration in Vocational Schools

BENJAMIN J. NOVAK
Vice-Principal
Frankford High School
Philadelphia; Lecturer in Vocational Education, Temple University

Federally aided programs of vocational instruction must offer as their major objective "training which will be advantageous in entering or continuing in employment in specific occupations or fields of work."[1] The bulletin from which this is quoted states further that "entrance to a vocational class should be based principally upon three factors: (1) the desire of the applicant for the vocational training offered; (2) his probable ability to benefit by the instruction to be given; (3) his chances of serving employment in the occupation after he has secured the training, or his need for training in the occupation in which he is already employed."[2]

In carrying out the letter and spirit of these provisions, the public vocational schools are continually enmeshed in many difficulties. How do 14- and 15-year-old boys and girls (often adults as well) know their real interests and needs? How much do they know about various occupations? What is involved in the mastery of a given occupation? Do they have the necessary attributes to find success and satisfaction in the vocational program chosen? If a mistake is made, how and when can a change be made — and to what shall the change be?



Trade exploratory student in metal shop at Dobbins Vocational Technical School

It is apparent that young people cannot be expected by random strokes of chance to gravitate unerringly into a school program first, and an occupation later, that will be for each sound, challenging, and productive. A program of selection by the vocational school helps to deflect some of the most apparently and grossly unfit from unwise choices, but is not particularly constructive, and should be but part of a co-ordinated system-wide program of guidance, cooperation, and information. Students should begin to explore their interests, learn something of their aptitudes, examine the occupational world, and make sound realistic choices, early in their educational life. Many junior high schools, by means of psychological tests, shop and club experiences, student activities, industrial visits, interest inventorying and other self-realizing occupational study, work experience, study of, and visits to higher schools, individual counseling, and other means, are aiding their students to develop and make choices which are reasonably sound and stable.

If a successful transition is to be made from junior high school to the next higher institution, it is important also that there be dissemination of knowledge and understanding among all personnel of the system. The misconceptions by many teachers, counselors, and principals that academic failures should logically be encouraged to enter a vocational school, must be replaced by a clear understanding of the nature and function of vocational education

[1] Administration of Vocational Education, Vocational Education Bulletin No. 1, p. 3.
[2] *Ibid.*, p. 31.

as part of an integrated system, having as its aim the best possible service to youth. The vocational schools can contribute to this understanding by the use of: films, printed matter, sending speakers to lower schools, encouraging visits by students and staff of other schools, showing initiative and co-operation in system-wide activities, and making evident that its selective and guidance services are functioning positively in order to aid youth, rather than negatively to reject and exclude them.

Even at best, there are all-too-many shifts and dislocations within vocational courses, dropouts, and failures of graduates to work in the occupational areas for which they were trained. No system that deals with human variables, many of which are beyond the reach of the school, can expect to attain perfection. This does not diminish the responsibility of the school for doing its utmost in regard to the problems just noted. The *George-Barden* Act of 1946 takes cognizance of the need for guidance in vocational schools themselves.

Appraising the Need

Many upper secondary schools are four-year institutions, and obtain their students in part or large measure from eight grade public or parochial schools. Many vocational courses are three years or less in length. Because of minimum age laws for employment and the assumption that greater maturation is likely to encourage stability and better achievement in vocational programs, many vocational schools set grade ten or age fifteen as the norm for entry into specific trade courses.

The graduate of the eight grade public or parochial elementary school generally has had few shop and non-academic exploratory experiences. His guidance services, with notable exceptions, of course, are likely to have been comparatively limited. Thus, the average elementary graduate approaches the threshold of his secondary education choice with a twofold disability — one in maturity and the other in experience. How, then, can he make a reasonably intelligent and sound choice of a program on an almost purely trial-and-error basis?

It is logical and justifiable that in this situation the ninth grade in the high school (general or vocational) be largely exploratory in nature, with embarkation upon a more specific educational program delayed until the start of the tenth grade. In the public vocational schools of New York City alone, there were in 1949–50 over 9000 students enrolled in the ninth year exploratory program.

MURRELL DOBBINS VOCATIONAL-TECHNICAL SCHOOL
Philadelphia 32, Pa.
ADMISSION FORM
(Student fill in this side only)

Name _____ Date _____
Address _____ Zone _____ Phone _____
Present School _____ Grade _____ Course _____
Address of School _____ Zone _____ Phone _____
Birth Date _____ mo. day year
First Name Father _____ ☐ (Check if deceased) First Name Mother _____ ☐ (Check if deceased)
Full Name Step-Parent or Guardian _____
Country of Birth: Child _____ Father _____ Mother _____
Choices of Dobbins Trades: First _____ Second _____ Third _____

I expect to stay here (check one)	Until course is completed ☐	Until I get a job ☐
Subjects failed — reason?		
Which subjects do you like best?		
Grades repeated — why?		
Times absent last term? Why?		
Times late last term? Why?		
Present health?		
Physical Weakness? — eyes, ears, heart, deformity?		
Have you been suspended? If so, why?		
Can you afford necessary expenses? (Carfare, aprons, trade tools, etc.?)		

Underline your Interests

Mathematics	Mechanical Things	Wood
Clerical	Mechanical Drawing	Art
Foods - Clothing	Science	Home
Children	Metal	Doing things for people
Electricity and Radio	Working with people	Writing for school paper

In what sports are you interested? _____
Do you sing? _____
What musical instruments do you play? _____

DOBBINS VOC.-TECH. SCHOOL — INTERVIEW RECORD Revised October, 1950—5M

RECORD OF INTERVIEW

Suggested Questions to ask:
Review answers to questions on reverse side.
Discuss following items and note any pertinent facts.
Reasons for trade choice.
Own choice or parents? Father's business?
How long has student wanted to study this trade?
Do you feel students desire for this training is intense?
Employment experience? Nature, necessity, hours per week.
Outstanding personality traits.

COMMENT:

INTERVIEW RATING

Personality ☐ Probability of Success ☐

Keys 1. Definitely not qualified, probably will not succeed.
2. Few good qualities, unlikely to succeed
3. Satisfactory qualities, likely to succeed
4. Good qualities, with probably outstanding success
5. Exceptional qualities, probably outstanding success

Interviewer's Signature _____

Front and reverse side of Student Admission Form

Characteristics of the Program

The trade-exploratory program in the vocational school is not eligible for federal subsidy. Half of the school day may be devoted to shop experiences, and the remaining time to classroom and other activity. It is important that the schedule of classroom subjects include offerings which will permit the student who so desires, to transfer to a general high school at the end of the exploratory year without loss of grade standing. The exploratory student should not be foredoomed to four years at a vocational school, if it is found more advantageous for him to enter another form of educational program.

Some major specific objectives of a trade exploratory program which are in addition to other more general aims are:

1. Help the student to appraise himself, his strengths, weaknesses, and interests.
2. Help the student to learn about the occupational world and his place in it.
3. Provide experiences which will aid the student to develop his personality and aid him in making intelligent choices.
4. Provide the student with a knowledge and understanding of the educational services of which he may make use.

Each incoming student should be interviewed, and a record made at this point of his shop preferences, if any. In Philadelphia the interviewing is done by shop teachers whose regular classes have been dismissed for a morning or afternoon. Testing is an essential part of the program of guidance. Standardized test data should be available on general aptitudes, special aptitudes, achievement, personality, reading, and interests.

It is recommended that group guidance be provided in a home room, social studies, or other department. Here the students can analyze themselves, their interests, experiences, and achievement. The students can make their own profiles[3] of their percentile standing on standardized tests, and use these as a basis for study and discussion with his parents and adviser (or counselor). The guidance program should also include tours of the school, excursions to industry, occupational information, motion pictures, and other devices.

The number and kind of shop experiences will depend upon various factors; including the shops available, the number of work stations, and the interests of the students. Administrative expediency notwithstanding, the placement in exploratory shops should not be arbitrary, but should be based as much as possible upon the aptitudes and interests of the students. In the Philadelphia program, students are asked early to indicate three shop choices. Whenever possible, they are assigned to the shop of their first choice as their first shop experience. If this is impossible they are given their second or third choice as the first shop experience, the first choice coming as soon as possible thereafter. Where interests are not well defined, shops are changed at intervals of about five weeks, permitting a maximum of eight shop experiences during the year.

In some cases, where interests and aptitudes are especially crystallized and matured, the same shops may be retained through several periods. As the year progresses and shop choices begin to clarify themselves, then assignments can be made to shops related to the specific choice. The last experience should be in the shop finally and specifically desired.

Where there are large numbers of exploratory students, shop classes may be organized consisting only of trade exploratory students. When this is the case, the shop experiences can more easily be adapted to the needs of the students. It may be possible quite often, to offer trade areas such as: wood, metal, service, building construction, graphic arts, and business, rather than more specific unit trade instruction. One difficulty in connection with separate shops for trade exploratory students is that it may reduce the flexibility of the program, and the students usually have less opportunity to exercise their choice of shop. Despite some limitations, to be noted later, some judicious placing of trade exploratory students in unit trade shops with upper grade students does broaden the program, and allow for more flexibility in administration, especially where numbers of exploratory students are small. Trade exploratory students should not be assigned out of their groups for their classroom experience. The classroom instruction of trade exploratory students should always be in groups segregated from the advanced students.

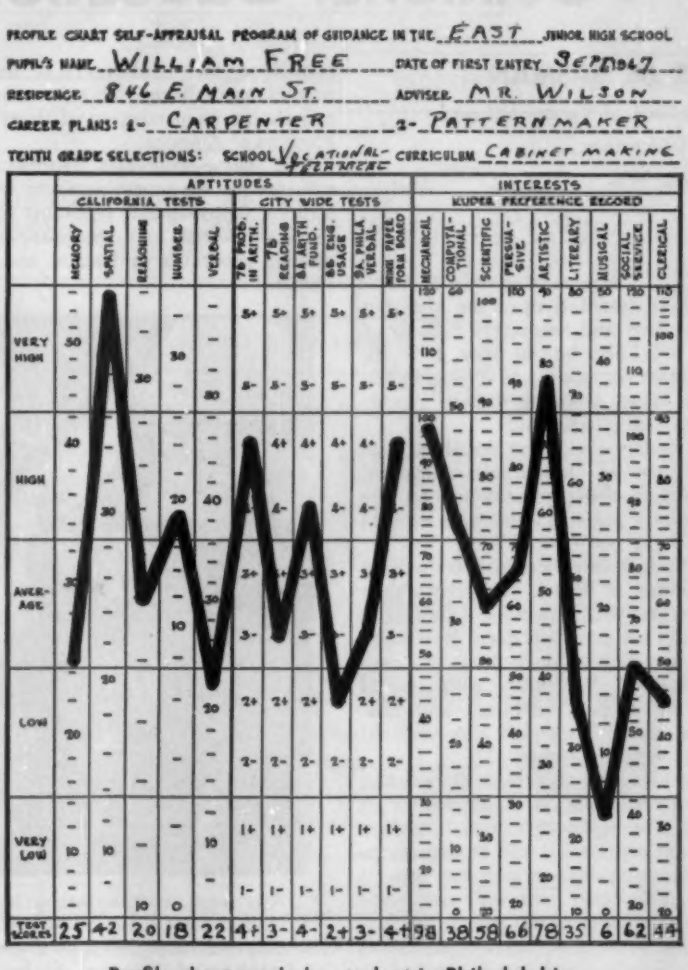
PROFILE CHART SELF-APPRAISAL PROGRAM OF GUIDANCE IN THE EAST JUNIOR HIGH SCHOOL

PUPIL'S NAME William Free DATE OF FIRST ENTRY Sept 1947

RESIDENCE 846 E. Main St. ADVISER Mr. Wilson

CAREER PLANS: 1- Carpenter 2- Pattern Maker

TENTH GRADE SELECTIONS: SCHOOL Vocational-Technical CURRICULUM Cabinet Making



Profile chart made by student in Philodelphia Self-Appraisal Program of Guidance

[3]See: "Self Appraisal Program of Guidance," School District of Philadelphia, 1950.

Other Considerations

A successful trade exploratory program calls for care in a good many directions. The teachers concerned must be aware of the objectives and values of the program, and be sympathetic to the special needs of the students. It is most desirable to include the teachers in the planning.

Often the shop teacher who is a tradesman primarily, may feel impatient at exploring with his youthful charges. If a few trade exploratory students are in a unit shop with older students, care must be taken to guard against neglect. Conversely, where enrollment in a shop is low, there may be excessive zeal in proselytism.

Personnel are needed to carry out the program outlined for the trade exploratory students. The testing, guidance, scheduling and rostering, all require a staff provided with the interest, special skills, and time to carry out the program. There must be conscious planning to enable the exploratory students to be integrated into the school. Activities have to be provided in which they can show to advantage and make a contribution to the life of the school. If this is not done, the older students will tend to dominate by reason of their greater maturity and sophistication.

Students who have completed trade exploratory programs, teachers, and educators, are in the main favorably inclined with regard to its value. There is no significant statistical evidence currently available to support or reject the efficacy of exploratory programs in meeting their stated objectives. Research is needed in this direction.

On the basis of empirical results, and the demonstrated need, the trade exploratory program in vocational schools is an educational project which appears to warrant further trial and development.

May Egypt Profit by These Studies —

Egypt Studies the U. S. System of Vocational Education

LOUIS M. SASMAN
State Board of Vocational and Adult Education
Madison, Wis.

Eight representatives of the Ministry of Education and Secondary Schools of Egypt left Cairo late in May, 1956, to spend from six months to a year in the United States studying various phases of vocational education.

Included in the group are three representatives of industrial education, four of agricultural education, and one of post primary education with emphasis on home economics.

The industrial-education men studied this summer at Wayne University; they also are studying programs of industrial education on state and local levels and in teacher training institutions in Pennsylvania and Wisconsin with special emphasis on the Pittsburgh and Milwaukee areas. They will also visit industrial establishments.

Two of the agricultural-education men are studying farm mechanics at one of the state agricultural teacher education institutions and in farm shops of local vocational-agricultural departments. The other two will visit state boards of vocational education, teacher-education institutions, and departments of vocational-agriculture in secondary schools in several states. They also attended summer conferences of instructors in agriculture and state meetings and the national meeting of the Future Farmers of America.

The home-economics representative will study state supervision and teacher training methods and programs of junior high school and secondary homemaking programs in Oregon and Wisconsin.

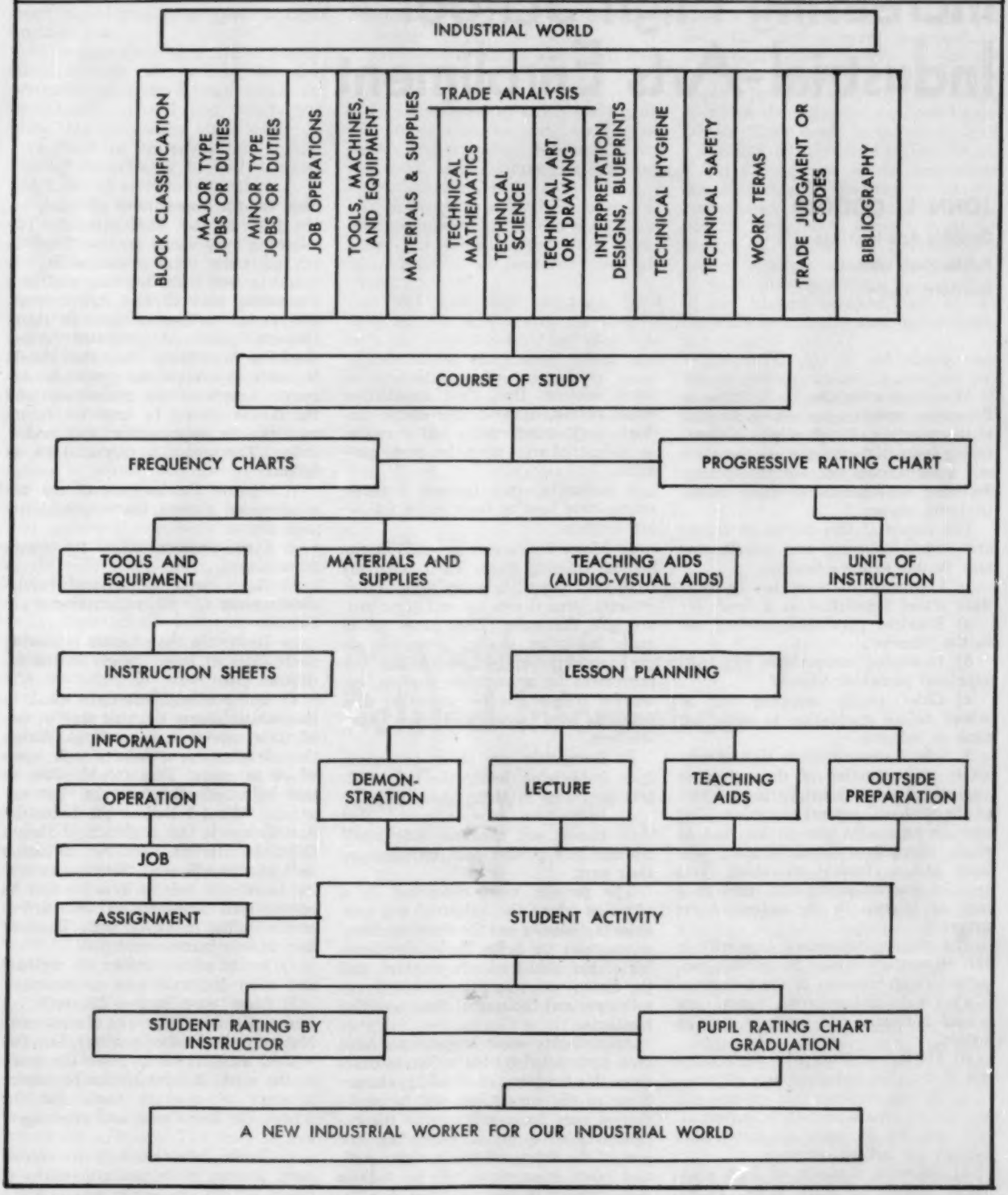
Fully as important as the skills gained and the observations made by these people in regard to the program of vocational education in their respective fields, is the impression they receive of America and the way people actually live. This program of *participant* training is an important phase of the whole program of technical assistance in the International Cooperation Administration.

Egyptian representatives leaving for the United States: Left to right — Adbel Hamid Fawzi Adbel Azy, Adbel Razzak Abdel Fattah Ibrahim, Ahmed Mohamed Mohamed Omar, Mrs. Sania Abdel Hamid, Mohamed Ibrahim Abdou, Dr. Mohamed Sayed Abdel Rahman, Mohamed Ezzat El Hilaly. Not shown, Anwer Ahmed El Behery

SOURCE OF TEACHING MATERIAL FOR INDUSTRIAL EDUCATION SUBJECTS

WITHRO McENGE

Professor and Head, Department of Industrial Education
Tuskegee Institute, Tuskegee Institute, Ala.



Prepared by Withro McEnge, professor and head of department of industrial education at Tuskegee Institute, Tuskegee Institute, Ala.

A Worth-While Effort —

Increasing High School Industrial-Arts Enrollment

JOHN E. COGOLI
Graphic Arts Instructor
Public High School
Hartford, Conn.

At a time when the U. S. Office of Education reports a nationwide increase in the numbers of high school students taking industrial-arts courses, there are still some schools who are experiencing declining enrollments in their industrial-arts classes.

The causes of this decline in classes and total industrial-arts enrollments may be due to the following:

1. A general decrease in the city-wide school population as a result of:

a) Resident population moving out to the suburbs.

b) Increasing competition with private and parochial schools.

c) Older pupils dropping out of school before graduation to work full time in industry.

2. School administrators lack an adequate understanding of the values to students of the industrial-arts as a part of the students' general education. This may be especially true on the part of those educational administrators who have had a classical education. This lack of understanding may lead to a lack of interest in the industrial-arts program.

3. Guidance counselors, especially in the elementary school have been suspected (with reasons) of the following:

a) Total unfamiliarity with the school industrial-arts program and its values.

b) Urging students with high I.Q.'s not to take the industrial-arts courses.

c) Telling students that colleges will not accept credits earned in industrial-arts courses as part of the credits needed for college entrance.

d) Allowing students of high scholastic ability to drift along, taking fewer subjects than their capabilities would permit. Many college-course students could comfortably add a course in industrial-arts work to their program.

4. Industrial-arts teachers, themselves, have been at fault in the following respects:

a) Many instructors are still in the manual training stage. Their programs have not changed in many years. Their projects, once drawn up and organized, are still the same. They have not in many instances, availed themselves of the opportunities for professional improvement by appropriate reading, extension courses, or by accepting suggestions from supervisors and fellow teachers.

b) Instructors are prone to refrain from publicizing justly the industrial-arts programs in their communities.

c) Instructors have assumed that their classes will continue indefinitely without any promotional activities on their part.

The persons most concerned in a situation where the industrial-arts program is declining are the students themselves, who are being denied the benefits of the industrial-arts program, and the instructors who face shrinking enrollments and limiting of their teaching positions.

Accordingly, some suggestions have been formulated by the writer to overcome this tendency of shrinking classes. Some of the suggestions will be easily carried out. Some will require the expenditure of a lot of energy on the part of the industrial-arts teaching staff, and other suggestions will be a little more difficult to work out since they depend on the expenditure of funds on the part of the administration. The following suggestions are not listed in any particular order of desirability. It would be well if the teaching staff in a community were divided into committees to act on one or more of them. Definite plans of proposed action should be formulated. Plans then should be made to execute the proposals. Accurate records of the proceedings and the results should be kept for future repetition or improvement and modification. The proposals suggested are as follows:

1. Improve the attitude of the administration toward the industrial-arts program.

a) Invite them to attend the classes in session.

b) Have carefully prepared curriculum guides for all industrial-arts activities.

c) Be certain the program is moving along lines of latest trends in the industrial arts.

d) Invite administrators to speak to the industrial-arts teaching staff at one of their regular staff meetings. Assign the administrator a definite topic upon which to speak. This should relate to the industrial-arts program, for example: "What I Believe the Industrial Arts Course in Our High School Should Offer the Student," etc. An invitation such as this will send this man scurrying to reliable sources in order that he appear well informed on the current trends in the industrial arts. Thus we help him to become educated!

e) Invite administrators to regional and other industrial-arts conventions.

f) Blow your horn — discreetly, of course. Exhibit the results of classwork. Not only the finished projects, but also written assignments to show the scope of the work. Exhibit results to administrators of projects made for the school, the Red Cross, and other agencies.

g) Invite administrators to accompany you on visits you may make to other schools in communities which

possess a desirable industrial-arts program (both in content and shop facilities.)

2. Stimulate the industrial-arts staff of instructors.

a) Encourage them to attend local staff meetings, regional and other industrial-arts conventions. See if they won't accept even minor posts in these organizations.

b) Induce them to do more professional reading, and to take the more pertinent extension courses which are conveniently offered and which will bring their philosophy up to date.

c) Have the instructors take a visiting day occasionally to visit a school which has an up-to-date program.

d) Invite these instructors to take an aggressive part in promoting the industrial-arts program locally.

e) Encourage these instructors to modernize their shops, projects, curriculum guides, and teaching aids.

3. Educate the guidance counselors.

a) Industrial-arts staff instructors should speak at meetings of guidance counselors to explain the industrial-arts program and its place as a part of general education.

b) Guidance counselors should have an opportunity to visit industrial-arts classes in session, and also to examine the curriculum guides.

c) Arrangements should be made so that guidance counselors would take elementary school students on a tour of the high school shops before these students make out their high school choices of study. Talks to the students, by a high school industrial-arts instructor, should precede this tour. These talks would give the industrial-arts instructor an opportunity to display his wares at a most opportune time. When the visit to the high school is made by the elementary students, the shops should be attractively arranged; all stations occupied, and samples or souvenirs of the work should be distributed.

d) Guidance teachers should be advised what colleges will accept industrial-arts credits toward entrance requirements, and in what amounts.

4. Strive to have the administration grant as many school credits to students for industrial-arts courses as are granted for other subjects, such as mathematics, English, etc.

5. Open all industrial-arts courses to girls, as well as to the boys. Some may claim that girls should be in separate classes. That question should be decided by the different schools or school system.

6. Modernize the present shops, and expand the offerings. This may take a bit of selling, since it will require, in many cases, an outlay of money.

7. Plan for effective public relations, in addition to that outlined above:

a) Have industrial-arts teachers and supervisors speak at P.T.A. meetings, faculty meetings, school assemblies, Rotary Club, Kiwanis, Lions, etc.

b) Arrange Parents' Nights, when parents can come to the school in the evening to see the school shops in operation and their sons and daughters at work.

c) Sponsor contests and clubs, such as model boats, model planes, model cars, etc.

d) Stress projects which exert a direct influence on the home, such as repairing and refinishing furniture, printing family social stationery, repairing home appliances, etc.

e) Co-operate with civic groups in their activities and the resulting publicity. For example: Red Cross activities, Christmas toy repairing, Soap Box Derby.

f) Seek appropriate newspaper publicity on the activities in the shop — both the class activities and those activities taking place after school and in conjunction with community agencies.

g) Plan attractive school assembly programs in which the industrial-arts students participate.

h) Check the literature given the students in relation to explanation and selection of high school courses of study. Does this literature do justice to the industrial-arts program? Does it need to be revised? Plan some action if it is needed.

In order to plan a course of action for promoting the industrial-arts program effectively, the staff should prepare a *calendar of action* which will list: date, item or event, proposed activities, activities engaged in, and results. The calendar of action would include a listing of all community events to which the industrial arts could contribute. These would be toy repair, Red Cross, etc., as mentioned earlier. In addition the calendar would carry dates for visits to the elementary schools, conventions, etc. The calendar would provide for planning for each event far enough in advance by specified personnel to insure adequate preparation. It would also co-ordinate the activities of the various subcommittees of industrial-arts teachers working on different projects.

Results of any of the above-mentioned activities should be carefully observed and recorded. In a program of this type, the activities must be repeated annually or at shorter intervals. The recorded results will provide a concrete basis upon which to revise and modify any follow-up action.

Notebooks That Are Helpful —

Methods of Teaching Related Information

LEWIS MALLOW, JR.
High School
Wabeno, Wis.

Many industrial-arts shops have been planned and set up with a minimum regard for an adequate lecture or planning area. This is especially true in the smaller schools where either the cost of including such an area is prohibitive or a limited amount of floor space prevents the inclusion of such an area. This does not imply that related information in the form of lectures and taking notes is omitted from the course, but that it does not take place under *ideal* conditions. The problem seems to center around the seating arrangement of students in relation to a chalk board and other visual materials to facilitate taking notes during a discussion. The disadvantage of having students sit on the woodworking benches and write is that it is very difficult for them to take presentable notes because of the rough bench surfaces and the sitting position. Teaching in a shop that does not have the *ideal* conditions, the writer approached the problem this way.

One method used was that of presenting material in the form of dittoed sheets compiled by the instructor, which contained the information to be considered. These were distributed to all students. A lecture-discussion period followed. At the end of the discussion period, the papers were inserted into looseleaf notebooks by the students and kept for future reference. Each information topic was followed within a day or two by a short test for purposes of

evaluation. This method eliminated the need to take notes using bench tops as writing surfaces.

Advantages

1. Convenient for students to bind their papers in their notebooks.
2. Information was condensed and to the point.
3. Made for uniformity.
4. Easy to present in class.
5. Did not require much time to present in class.

Disadvantages

1. Requires much time to prepare and ditto.
2. Students were not taking an active part in the construction of the papers and therefore pride of accomplishment was lacking.
3. Notebooks had a minimum of personal value.

Another method was tried and is the one the writer is presently using. Again the problem centered around the lack of convenient writing stations. This time an attempt was made to overcome rather than avoid the problem and still keep within good educational theory. Students were seated at the woodworking benches as before, but this time given scratch paper (clear one side) which came from the commercial department. Material was put on the chalkboard by the instructor and copied by the students. During this time discussion also took place. Within an allotted time this information was transferred from the rough draft to a spiral ring notebook and turned in for correction and credit. This eliminated the need for neatness and organization on the original rough draft as it was taken care of when the material was transferred to student notebooks. At this time neatness, organization, and originality were emphasized. Students were required to letter all notes rather than write them. This assisted them to perfect their lettering skills. This work, of course, was done out of the shop. The first sheet of each spiral notebook was reserved for a table of contents. As entries were made, titles were written on the page used for the table of contents and included the page numbers where those particular information topics could be found. Tests followed each information topic. According to test results this method proved better as far as retention of material than the method of using dittoed sheets. The reason was probably due to the fact that students were in contact with the information twice — first when the rough draft was made and again when the material was transferred to their notebooks. Notebooks were then stored in a shop-plans cabinet for future use.

Advantages

1. Students showed pride in accomplishment.
2. They were taking an active part in the construction of information topics.
3. Eliminated the additional work required by preparing dittoed sheets.
4. Students completed a notebook that had personal value.
5. According to test results — very satisfactory for retention of material.

A Helpful Study —

Survey of Students' Needs and Interests

RALPH C. MAYO
Teacher-Coach at South High School
Vocational Instructor
Worcester Boys' Club
Worcester, Mass.

The following survey was conducted to determine the needs and interests of four hundred boys at South High School, Worcester, Mass., and to find out whether the subjects being offered prepare the majority of the pupils for lifework, for avocational interests for leisure-time activities, and also to show the relationship between the father's vocation and the son's aspirations.

Father's Occupation	*Vocation Student's Choice*	*No. of Students*	*Hobbies*	*No. of Students*
10	Airplane mechanic, auto mechanic, shop mechanic	50	Sports (baseball, football, basketball, track)	115
9	Mechanical engineer, electrical enginer, structural engineer, civil engineer, Diesel engineer, aeronautical engineer	75	Airplanes — gas models, rubber powered, and solid	37
10	Draftsman, designer, architect	38	Woodworking	17
4	Electrician	15	Reading	15
0	Pilot (aircraft and commercial	25	Camping	14
1	Teacher of industrial arts, teacher of academics	14	Hunting and/or fishing	13
4	Woodworker, carpenter, cabinetmaker	9	Winter sports	15
2	Chemist	15	Roller skating	12
25	Machinist	10	Music	10
5	Fireman	8	Photography	9
0	Forest ranger and guide	6	Dancing	10
5	Policeman, state trooper, F.B.I.	8	Crafts	8
15	Shop foreman	5	Automobiles	7
0	Flight instructor	6	Mechanical drawing	6
3	Store manager	6	Arts	5
10	Clerks	7	Horseback riding	6
1	Ship navigator	4	Nature study	5
17	Wireworkers	1	No hobbies	15
10	Clerk	7	Boating	4
1	Physical ed. coach	4	Stamp collector	4
0	Music teacher	3	Travel	4
11	Salesman	4	Collecting movie star pictures	3
0	Male nurse	5	Clubs	5
1	Farmer	3	Chemistry	4

Father's Occupation	Vocation Student's Choice	No. of Students	Hobbies	No. of Students
7	Shoeworker	0	Poetry	3
8	Truck and bus driver	2	Painting	3
8	Office position	4	Collecting junk	2
3	Mailman	2	Radio	2
12	Tool and diemaker	2	Training dogs	1
7	Sheet-metal worker	3	Hiking	2

Father's Occupation	Vocation Student's Choice	No. of Students	Father's Occupation	Vocation Student's Choice	No. of Students	Father's Occupation	Vocation Student's Choice	No. of Students
8	Steelworker	1	0	Major league ball player	3	0	Soldier	1
6	Shipper	0	6	Railroad engineer	2	0	Tree surgeon	2
9	Inspector	2	8	Molder	1	0	Radio technician	3
12	Assembler	1	2	Pressman	0	0	Writer	2
0	Doctor	2	2	Expeditor	0	2	Employment manager	0
5	Administrative	2	2	Stereotyper	0	1	Ragman	0
6	Maintenance	1	2	Millwright	0	4	Wire inspector	0
4	Shop superintendent	0	2	Janitor	1	1	Jeweler	1
2	State employee	1	2	Tinsmith	0	1	Hosiery worker	0
6	City employee	0	2	Payroll supervisor	1	1	Yard Conductor	0
2	Musician	2	2	Baker	0	2	Laundryman	0
4	Galvanizer	0	2	Finisher	0	2	Surveyor	0
3	Insurance	0	1	Rigger	0	2	Welder	0
4	Electric Light Co.	0	1	Bartender	0	2	Pullman carmaker	0
4	Retail oil	0	2	Personnel manager	2	1	Cleaner	0
2	Roofer	0	2	Painter	0	3	Grinder	0
2	Real estate	2	2	Milkman	0	12	Machine operators	0
1	Motor vehicle inspector	3	2	U. S. Navy officer	1	1	Diemaker	0
3	Contractor	2	2	Veterans' counselor	0	1	Shoe rebuilder	0
4	Meat butcher	2	1	Candymaker	0	1	Weaver	0
4	Fireman (Boiler)	1	0	Priest	1	20	Retired or deceased	0
4	Telephone worker	1	1	Minister	1		Undecided	5
5	Plumber, Steam fitter	0	0	Sailor	3			
0	Professional boxing	2	0	Marine	2	392	*Totals*	392

Exploring Educational Frontiers —

An Integrated Industrial-Arts Program for the Junior High Schools

DONALD L. LIPPOLD
Director, Industrial and Adult Education
Public Schools
Waterloo, Iowa

The opportunity to explore has not diminished with the passing of our frontiers. To teacher and students, unnumbered frontiers have been opened in our complex industrial society and are waiting to be explored. This is especially true in the area of the junior high school industrial arts. But it takes courage for the teacher and administrator to explore new concepts and pursue action which they feel will meet the needs of the junior high students.

One of the essential challenges of our modern school is to offer an adequate and effective educational program to the children of a highly developed and ever changing industrial society. All education should be geared to fit the needs of the students which it serves.

In recent years in the Waterloo Public Schools, the teachers, superintendent, principals and supervisors of art, homemaking and industrial arts, working co-operatively, took a bold step to develop an integrated program in the junior high school. The outcome was an exploratory course in art, homemaking, and industrial arts. Although it has three areas, it is in reality one course for the areas are integrated as in life and interdependent rather than separate. These outcomes have, therefore, been written with this in mind.

1. Establish policies and effect a program of activities which will make it possible for boys and girls of all socio-economic levels to participate on equal terms.
2. Provide an understanding of modern industrial processes.
3. Provide general information which will lay a foundation for the more specialized areas of art, homemaking, and industrial arts.
4. Recognize that the development of good citizens is the joint responsibility of all teachers in conjunction with parents and community agencies.
5. Provide the students with experiences which will lay a foundation for an appreciation and sensitivity for aesthetic values.

Industrial-arts shop in the exploratory program; (at right) the finishing room in the industrial-arts shop

6. Establish a teacher-pupil relationship which will provide a security for the pupil who feels markedly different by reason of rapid or retarded growth, socioeconomic status, etc.

Overview of Program

One half of the pupil's day in grades seven and eight is spent in the traditional academic areas of English, mathematics, and social studies. The balance of the school day is devoted to courses such as physical education, health, music, journalism, speech, and an exploratory course in art, homemaking, and industrial arts. The latter course is now in its eighth year in the Waterloo Schools.

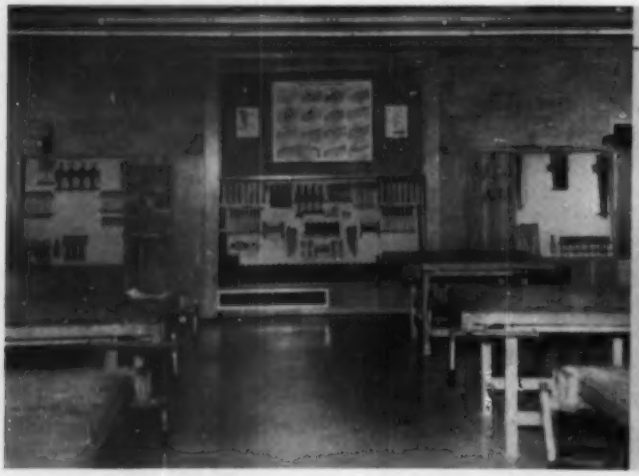
In the exploratory course, the pupil finds the art teacher, the homemaking teacher, and the industrial-arts teacher working as a team. The art instructor assists the student and other instructors in attaining greater creativity in the use of color and design. In like manner, the homemaking and the industrial-arts teachers contribute their knowledge and skills to assist the student and other instructors in planning and completion of projects. The student not only works in the traditional media of wood, food, and clothing, but many others. The students plan and construct projects using such crafts as basketry, beadwork, bookbinding, enamel, camp cookery, carving, ceramics, leather, metal, plastics, printing, and weaving, to name only a few. The craft offerings vary somewhat from year to year as teachers and pupils learn to work with new media and as pupil interests vary. At the present time, fly tieing, netting, archery equipment, and lamp projects are popular with the students.

The art, homemaking, and industrial-arts teachers, as a group, are assigned 75 to 90 per class. A free exchange of students between the three instructors is encouraged as the student requires assistance with color, design, or a process.

The pupil's fee is $1.50 per year, supplemented with $1.25 allowance per pupil from the instructional supply account. This fee is adequate in most cases, but if more elaborate projects are chosen, the pupil pays the additional cost.

The problems presented when starting such a course as this are numerous, but not unsolvable. In an attempt to provide many creative experiences, it is either necessary to have a varied inventory of supplies on hand, or supply procedures so efficient that requests may be met in a few days. The flexibility of the program makes it difficult to anticipate the varied requests for supplies.

The exploratory program permits the student to (1) experience the pleasure of designing and executing projects in a variety of media, (2) explore and determine his interests in order to choose more intelligently in the elective area of the high school program, (3) realize the interdependence of the three areas as related to everyday life, (4) partici-



Tool panel and storage in the industrial-arts shop at McKinstry Junior High School, Waterloo, Iowa; (at right) the exploratory program in industrial-arts department

The art room in the exploratory program; (at right) the homemaking room in the exploratory program. This is an all-purpose room — not all area shown

pate in a situation which requires his working with other students, (5) satisfy individual needs, (6) opportunity to develop problem solving techniques, and (7) experience and increase his skill abilities.

Organization

The organization of the individual classes in the exploratory course will follow in a manner that is suitable to the areas in which the activity is taking place. Each instructor should organize his class in a manner that will promote the greatest freedom of expression so that the child may develop and explore his interests and abilities.

The class atmosphere is very important. In this course it is expected that the class will be more informal than is possible in many subject matter areas. For that reason careful planning and organization are very important. There should be sufficient work for all students at all times and sufficient tools and materials with which to work. While it is expected that students will move around and converse as the need arises, this does not mean that incessant conversation or disorderliness is condoned. The class atmosphere should be one which is conducive to getting things done and should be one of freedom with self-control.

It is suggested that the student be allowed to participate in the class organization as much as possible. This may be done through the use of the student personnel plan. The student personnel organization serves two primary purposes in an activity area. It gives the student an opportunity to gain experience in personnel relationships and provide necessary help for the instructor. If the student is to get a correct impression of the relationship of personnel in organized groups of society, he should then be given experience in being responsible to his classmates both as a leader and as a member of a group.

In the operation of personnel plan, the instructor with the aid of the students should develop a personnel organization that will fit the needs of their activity area. For example it may be advisable to have an activity president, superintendent, manager, or foreman who is responsible for certain areas of the shop. Specific tasks are assigned to each individual of the class. These positions may be elective or appointed, whichever seems advisable. If a group remains in an area for an extended length of time, these responsibilities may be rotated in order to give the maximum number of students an opportunity to experience leadership.

The students should understand the plan completely and be brought to realize that they are responsible for the management of their own activity area. In short, the plan must be democratic if it is to serve its purpose.

Evaluation

While evaluation is always difficult, it becomes even more complicated in an exploratory course. This course encompasses creative thinking and planning as well as the developing of such personal qualities as co-operation, getting along with others, initiative, etc. Therefore, considerable thought is required for understanding and interpreting the child's development.

To assist the instructors in the exploratory course in evaluating the students, the following suggested points are included. These are not the only possible points to be considered, but are some of the important ones which might well be the basis for grading.

1. The child shows good personality development. He is industrious, co-operative, has initiative and gets along well with his classmates.
2. The child sincerely attempts to be creative in his thinking and planning.
3. The child is neat, careful, and skillful to the degree that can be expected in consideration of his physical, mental, and emotional background.

The student should be evaluated individually and not by comparison to other students. He should be guided into recognizing the worth of the qualities we are trying to develop and helped to see where he is successful or unsuccessful in demonstrating the presence of these qualities in his own conduct.

During the life of the World War II GI bill nearly 8,000,000 veterans received education and training benefits. At present only about 70,000 World War II GI's are in training. — *Express News Letter.*

Shop, Look and Listen . . . "No, no, Fenwicke! . . . I only meant it figuratively!"

— Al Marino, Pennsylvania Training School, Canonsburg, Pa.

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

THE FIRST SEMESTER IS COMING TO ITS END

JUST what does that pose for the shop teacher? Have you checked over what your students have acquired in your classes so far in this school year? Are you satisfied with what they have accomplished? Have they a good idea of why they have been in your shop? How has your contact with them affected their life for the future?

What can you do, from now to the end of the semester, to improve what you have already accomplished with them and for them up till now? Don't you think that a brief test at the present time would give you a good basis for some concentrated helpful work at least for a certain number of those who are weak in one or more areas of your work.

Incidentally, that test would also show up things that you might like to change for future classes, and in that way improve your course for the students who will come to you for the second semester of the present school year. And then have you placed any emphasis on having your students take an interest in one or more hobbies. It is pitiful to meet men who have reached the retirement age who have no real hobby. There are many of these people whose only relaxation for many years has been playing card games. That is a hobby all right, but not one to satisfy a retired person for any length of time, unless he has other interests at the same time.

Spend some time in helping your students to list things they would want to do were they at the retirement age. Call the attention of your boys to the fact that the present era is pitifully overstocked with people suffering from mental ailments.

Reading is a fine hobby, but it will be pretty difficult for an older person to indulge in that pastime day after day as he grows older. There are numerous things from which a person can derive interest. Get the boys to make a list of hobbies that they would like to adopt even now. Warn them that as they grow older, their limbs may not be strong enough to permit them to do hiking, playing strenuous games, or doing anything that requires extremely good sight, or physical strength.

But above all, do not forget the tests that ought to be given now that the semester is nearing its end. Give the boys a chance to do well in their final.

PREPARE YOUR BOYS TO PRACTICE SAFETY

THE reports from The Travelers Insurance Companies, Hartford, Conn.; the Accident Prevention Department of the Association of Casualty and Surety Companies, New York City, N. Y.; and the National Safety Council again and again call attention to the fact that prevention of accidents, whether on the road, on the job, or in the home, is a never ending obligation for all of us. Our greatest killer, crippler, and waste producer is the motor vehicle. It is in this field of safety education that the school can do much to assist in cutting down the frightful carnage, and waste. Care in driving is difficult for untrained youngsters.

The home is next in furnishing a large number of fatalities and accidents. There, too, the school with its practical subjects, has an opportunity to teach safety courses that will eventually save many lives, prevent much suffering, and cut down the monetary loss produced by accidents.

Accidents on the job are many but school shops and industry are making headway in cutting them down. As already stated, the prevention of accidents is a never ending obligation. It is well to remember this always, and do our utmost in the school, the home, and on the highway to protect the young and the old against harm and damage of every kind.

WORTHWHILE CLUB WORK

HAVE you a maintenance club in your school? Such a club is practically a must for the school shop. Maintenance work, of course, does not necessarily arise in the shop, but a goodly amount of it arises there. But no matter where it may be found, the boys in the school shop have the tools and equipment to take care of most of it, and taking care of it teaches many important lessons for the boys' present and future life. Furthermore, boys who learn how to make repairs acquire some insight into the cost of making them. They will, therefore, gradually overcome the habit of thoughtlessly destroying things just for the fun of doing it.

The work done with and for the maintenance club would also prepare them for doing this type of work in their homes. If properly handled the members of the club will learn to do it gratis for the good of the school, home, or community. Working with others also adds pleasure to the work and trains the boys in co-operating with each other.

HELPING FELLOW TEACHERS

HAVE you ever thought of writing up one of your better projects which you have designed for the students in your classes? Unfortunately, too many teachers are inclined to feel somewhat modest about doing this. They seem to think that others might feel that they are trying to *show off*. They seemingly do not realize that there are many teachers who do not know how to design a new project, and yet are anxious to adopt one if they can only find one.

The same is true of a new method for doing certain work in your classes, or a new way of testing your students, or of keeping your records. It is a well-known fact that one can learn or understand a subject better and more easily after having taught the rudiments of the matter to someone else. Then, too, some feel that they are losing something when they disclose what they are doing or show others what new projects they have designed.

These good men should understand that when one is doing something to help others, it is bound to do some good to oneself as well, and that it is worth while to publish an article on it so that others can profit from it also.

Especially is that true of new project designs. It is not difficult to write such an article. If you have made a good working drawing of the object, there is little need for a lengthy article. As a matter of fact, industry insists that a working drawing should be so complete that a good mechanic can go ahead with making the article shown without asking any further questions.

If then you have inaugurated something new in your classes, be it a project, teaching aid, method of handling or storing materials, tools, and the like, write it up and have it published. It will give you prestige with the administrators of your school, and help many of your fellow teachers who read the same professional magazine to which you subscribe.

Courses Should Be Based on Objectives —

A Two-Year Industrial-Arts Woodworking Course

WILLIAM L. LEWIS
Building Techniques Instructor
Roosevelt School
Gary, Ind.

Industrial-arts education attempts to present, on a somewhat smaller scale, experiences as they actually exist within the walls of industry. It provides a basis for an understanding, and knowledge of the composition of materials, and manufacturing processes used throughout the world, and practices in working with simple machines, and the most common tools and materials. Heber A. Sotzin says:[1]

Industrial arts is that part of general education concerned with satisfying man's innate desire to construct with concrete materials and the development of an intelligent understanding of our modern industrial civilization and the problems which have resulted from it, through contacts and experiences and tools of manufacture.

Its function in the total school program is an integral part of general education. It occupies the same relationship to the school's curriculum as the areas which comprise social studies, health activities, fine arts, language studies, etc. It does not attempt to develop skills to earn a livelihood to another field of education known as vocational education.

The Objectives of Industrial Arts Woodworking

On the basis of (1) available knowledge relating to adolescents, (2) knowledge relating to the psychology of learning, (3) the philosophy of the school in which the course is to be presented, (4) implication of the needs and demands of the community, and (5) expressed findings of writers in the field, the following objectives for pupils have been formulated for the course:[2, 3]

I. To acquire knowledge of the processes of several woodworking industries.
II. To develop habits of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.
III. To develop a sense of co-operation in group undertakings — the ability to work and plan well with others in efforts to complete a common task.
IV. To acquire the habit of careful and thoughtful work without loitering or wasting time.
V. To acquire safety habits in working with tools, machinery, and materials.
VI. To acquire appreciation for good design and workmanship — the ability to judge a product in terms of these aspects.
VII. To acquire the ability to read working drawings and diagrams — an understanding of scale reading, and the meaning of symbols.
VIII. To develop an attitude of pride or interest in his ability to do useful things — a feeling of pride to the accomplishment of worthwhile tasks.
IX. To acquire exploratory experiences in the field as a means of helping the student in his efforts to choose a vocation which is appropriate for him.
X. To develop skills to use elementary mathematics required in woodworking.
XI. To develop basic skills in the use of woodworking tools and machinery.
XII. To develop the ability to identify and evaluate the general characteristics of materials used in woodworking — the development of a background which permits the recognition of the structure, classification, and behavior of materials.

Industrial arts offers preliminary exploratory experiences in many occupations and may help a student select a vocation. It should be flexible so as to provide for individual needs and interests. In many schools, this department is given the responsibility of providing some of the experiences that will help the so-called dull pupil adjust himself to the environment in which he lives.

[1]H. A. Sotzin, "A Comparison of Industrial Arts and Vocational Education," INDUSTRIAL ARTS AND VOCATIONAL EDUCATION, XXXII (Apr., 1943), 152–153.

[2]Glenn D. Warrick, "Industrial Arts Objectives," INDUSTRIAL ARTS AND VOCATIONAL EDUCATION, XXXVI (Sept., 1947), 287–288.

[3]R. C. Woellner, "Industrial Arts in General Education," *Chicago University Dept. of Education Proceedings of the Tenth Annual Conference of Administrative Officers of Public and Private Schools*, IV (1941), 69–78.

Methods and Teaching Aids

When the industrial-arts teacher undertakes to accomplish the objectives that are accepted for his field, he uses many instructional materials, techniques, and methods of procedure in presenting situations that are conducive to learning. The most frequently used are:

1. Verbal material — including planned lectures, class discussions, and printed instructional materials.
2. Teacher demonstrations — including machine operation, safety precautions, handling of tools, the processing of materials, layout procedures, use of measuring instruments, and the interpretation of blueprints and sketches.
3. Visual and audio-visual aids — including charts, photographs, filmstrips, models, field trips, exhibits and museums, and motion pictures.
4. Laboratory practice — including the operation of machines, the use of tools, and a more comprehensive examination of materials by the students.

The Problem

Each of the foregoing methods of instruction is of great importance to the industrial-arts teacher; however, each method should be evaluated in terms of what it will contribute to a given task, before too much emphasis is placed on any one of them, or any combination of them.

The writer is employed as an industrial-arts teacher in a public school where extreme heterogeneous grouping is prominent in high school industrial-arts classes. As is to be expected, difficulty is encountered in providing appropriate learning experiences for each student enrolled.

This paper is to serve as an exemplar for possible means of handling the situation in a manner which is conducive to the achievement of the objectives of the course. An attempt will be made to supply answers to the following questions:

1. How can learning experiences be evaluated in this phase of education?
2. How can the progress of students be evaluated in this phase of education?

The answers will be based on the

experience of the writer and information and data gathered from educational literature and films.

Limitations

The major limitation of this article is the relatively short period of time involved in the study of possible solutions to the problem stated. The program will be presented here in a somewhat general manner so that more specific planning and adjustments may be made as deemed necessary.

Since specific planning requires a great deal of time for studying and trying-out techniques, the writer feels that efforts along this line should follow the present effort.

CLASSROOM MANAGEMENT

Use of Class Period

In the school situation under consideration, the teacher must plan class activities to fit into a fifty-minute period. This short period is hardly adequate for shop classes because at least 15 minutes of the time is consumed in the handling of tools and materials. This provides for only 35 minutes of actual classwork.

Although the writer would recommend at least a 90-minute period, the fact remains that plans have to be made to provide the best possible learning situations that can be presented during a 50-minute period.

After careful consideration of the characteristics of adolescents and the objectives provided for them, it is suggested that 80 per cent of the class time be spent for manipulative work. Approximately 20 per cent of the time will be given over to related work and demonstrations. This course of action will be followed each day except on occasions when motion picture films require the use of the entire 50 minutes to present and review a 15 minute film.

The major influences for providing a larger proportion of the period for manipulative work may be listed as follows:

1. The innate desire of human beings to create worthwhile objects;
2. The restlessness of adolescents when they are restrained from participating in activities which seem important to them;
3. The very nature of the course demands this procedure.

In order to avoid unnecessary loss of time, tools are mounted on wall panels so that the student may select and replace them rapidly. Necessary materials are rationed and made available to each group to provide for the least loss in time in issuing them.

Each pupil is assigned a permanent work station, and is expected to leave it clean and orderly at the end of the class period. This eliminates the necessity for making special daily assignments for this task.

Recording

As a means of recording classroom activities and progress of pupils, the following list of forms may be used:

1. A progressive chart will be kept showing the processes and operations performed by the pupils.
2. A related lesson topic sheet will be kept showing dates of topics and demonstrations given.
3. Individual record cards and cumulative project records will be kept for each pupil.

The following pages present examples of the type of forms that may be used at present. Others of this type may be drawn up as needed.

Learning Experiences and Evaluation Techniques for Objectives Not Necessarily Limited to a Specific Semester Level

Consideration will be given to methods used for the attainment of each of the objectives listed. These methods serve as examples for others that may be developed and used as needed.

Experiences for Objective I

To acquire knowledge of the processes of several woodworking industries.

Because of the limited experience of high school students, the attainment of this objective warrants the use of good motion picture films which give an overview of woodworking occupations. Films are valuable for providing close-up views of (1) the time-lapse technique which depicts the highlights of an activity in a relatively short period of time, (2) their facilities for quickly and effectively summarizing a subject.

In presenting a film effectively the teacher must follow the steps listed below:

1. Preview the film to ascertain its content and worth.
2. Prepare the students by telling them what to expect.
3. Present the film.
4. Follow up with pertinent questions and comments.

The films selected to provide experiences for this objective are:

1. "The Woodworker" (Your Life Work Ser.) — 11 min. 16mm. sound. Produced by Vocational Guidance films. The film points out the many phases of the building industry that employs thousands of men who work with wood. Furniture factories and pattern-making establishments employ woodworking craftsmen in large numbers. The film shows carpenters erecting scaffold, setting forms for concrete foundations and walls. Men are shown constructing a house from foundation to the flooring and finishing. Millworking operations are portrayed such as, sash and doors, stair building, and cabinet assembly. Small cabinet shops offer another field; work in veneer furniture factories is outlined.
2. "Furniture Craftsman" (Your Life Work Ser.) — 15 min. 16mm. sound. Produced by Vocational Guidance Films. This film depicts the procedures and materials used in the chair industry. It shows experienced craftsman performing operations in carving, assemblying, and finishing.

These films may be used to orient new students, and as a means of review for students who have already seen them.

PROGRESSIVE CHART FOR ONE SEMESTER

Name of Pupil	Project	Fundamentals	Inspection Date	Remarks on Progress	Finishing Date	Remarks and Grade

RELATED LESSON TOPICS

Topic and Demonstrations	Date	Response of Pupils

Evaluation

The following test items are samples of questions that may be used to obtain evidence to which the students have achieved the objective.

1. List seven statements pertaining to the activities and surroundings of the workers shown in the two films.
2. List five operations performed by cabinetmakers.
3. List five operations by carpenters.
4. List five operations performed by patternmakers.

This is an attempt to determine the extent to which the students have gained knowledge of the similarities and differences of the processes used by craftsmen of the major woodworking trades.

The results of this evaluation will be used to determine the changes that may be needed in the presentation of the instructional material; and to discover students who may need special assistance.

NOTE: This evaluation technique and others included in this paper will have to be tried out with groups of students before their validity and reliability can definitely be established.

Experiences for Objective II

To develop self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.

This objective may be attained only if the student is convinced that the importance of unassigned tasks are just as great as the assigned tasks. For example he must see the need for keeping his work station in order. He must appreciate clean and orderly surroundings.

The teacher has a controlling influence in this situation. If the student sees his teacher getting his hands soiled while straightening out the supply racks, and repairing and caring for tools and machinery, it is likely that the importance of these tasks will be implanted. Consideration for such tasks should be given in the grading of the progress of students.

Evaluation

Observation of the behavior of students is probably the best technique available for measuring this trait.

Objectives III and IV

To develop a sense of co-operation in group undertakings.

To acquire the habit of careful and thoughtful work without loitering or wasting time.

A group project such as the construction of a storage cabinet, or stage settings requiring the aid of four or five students might prove adequate in this situation. The students will be given specifications for the job, and allowed to plan the working procedures on their own. The teacher will give assistance only when it appears absolutely necessary. After the planning has been completed, the materials necessary for constructing the project may be selected with the assistance of the teacher. Then, the students will be permitted to proceed.

Evaluation

Here again, we find that observation appears to be the best available technique for getting an indication of the behavioral changes taking place within the student.

Objective V

To acquire safety habits in working with tools, machinery, and materials.

A series of six ten-minute lectures relating to safe use of tools and machinery supplemented by a good film on safety in the shop should serve to make the students mindful of the precautions necessary.

The motion film to be used is:

"Safety in the Shop," 12 min. 16mm. sound. It dramatizes typical shop accidents and shows how carelessness on the part of the workers and supervisors may be the real cause of accidents. It points out the many dangers involved in production work. A good informational film showing actual working situations is produced by the United States Office of Education. It is distributed by Castle Films.

The presentation of the lectures and film will be followed up by discussions with the class to bring out the most important aspects of the lesson.

Evaluation

The teacher will watch for signs of carelessness on the part of any of the students. This observation will continue to determine whether the teaching method has been sufficiently effective.

Objective VI

To acquire appreciation for good design and workmanship.

Newspaper and magazine clippings of photographed furniture advertisements will be mounted and presented to the class with comments regarding the most desirable designs and workmanship.

The classes will be grouped and escorted to a nearby retail furniture store to study the pieces and price value assigned to the different types. A follow-up discussion will be carried on as a means of clarification of questions that may exist in the minds of the students.

Evaluation

The technique used in this situation will be to permit the students to design and construct several small pieces of house furnishings.

The teacher will inspect the projects carefully in his efforts to determine the influence of the instructional activities on the behavior of the students.

Objective VII

To acquire the ability to read working drawings and diagrams — an understanding of scale reading, and the meaning of symbols.

Students who enroll in the high school general woodworking course should have had the opportunity of taking at least two semesters of work in mechanical drawing. This provides some background for understanding most of the symbols used in elementary woodworking blueprints.

As a further step toward this kind of understanding, exercises for the interpretation of blueprints will be presented. This includes having the students make picture drawings as a result of their interpretation of three-view plan drawings.

Picture drawings are helpful in assisting a person to picture or visualize an object. There are several kinds of picture drawings — perspective, isometric, oblique, and cabinet. Each kind has its advantages and uses which are explained in the textbooks on drawing.

Isometric is generally preferred and its principles should be understood. In making this kind of drawing a vertical line and two lines on opposite sides (of the vertical line) drawn 30 degrees off the base of the drawing board are called the isometric area. All lines drawn parallel to these axes are called isometric lines.

In making an isometric mechanical drawing measurements are laid off on the axes or isometric lines only. All edges of the object which are vertical are drawn vertical; parallel edges are drawn parallel.

Lines not parallel to the axes are known as nonisometric. They are drawn by locating points on the isometric lines and joining the points.

A circle in isometric is not round; it is an ellipse. It is drawn by first making a square in isometric and then locating points through which the ellipse is drawn. Details of building construction are sometimes drawn in isometric. They may be drawn to show how parts fit together.

The following instruction sheet is an example of those that may be written and passed on to the students during this part of the course.

Evaluation

Projects are assigned so that the students will have to be able to visualize the finished product in order to make the project according to the specification of the blueprint.

Information Sheet

How to Use a Scale

A small object would always be drawn on full size, that is, if the length of an object was 4 in. long, and 2 in. wide, the draftsman would make the drawing to the actual size. However, it is generally necessary to make the drawing smaller than the actual object. This can be conveniently put on a certain size of paper by the reduction of an object, known as drawing an object to scale.

The foot is usually used as the basis in determining the scale to be used in laying out a drawing architecturally. If the scale is half size, it would be written

6 in. = 1 ft. ¾ in. = 1 ft. means that every three-quarters inch equals one foot; a scale of one-quarter inch equals one foot means that every quarter inch on the drawing is laid out on a scale of ¼ in. equals 1 ft. If the building is very large, the scale is usually ⅛ in. equals 1 ft. The *details* of the house are usually drawn full size.

Take up your scale and examine it. On one side you will find a foot laid out in standard inches, showing sixteenths. This, of course, is a full sized scale. Now turn the scale and find the side showing ⅛ marked at one end, also locate the figures 3/32, 3/16, ¼, ⅜, ½, 1, 1½, and 3. These figures represent the various scales and would be written 3/32 in. = 1 ft., etc.

Examples

1. On scale ⅛ in. = 1 ft., find 26 ft. 9 in.
2. On scale ¼ in. = 1 ft., find 7 ft. 11 in.
3. On scale marked ½ in. = 1 ft., find 9 ft.
4. On scale marked ⅜ in. = 1 ft., find 16 ft. 8 in.
5. On scale marked 1½ in. = 1 ft., find 7 ft. 16¼ in.
6. On scale marked 12 in. = 1 ft., find 3 ft. 1 in.
7. On scale marked 3 in. = 1 ft., find 1 ft. 10½ in.

NOTE: Draw each problem out on a piece of paper, letting a straight line represent the length of each problem.

Objective VIII

To develop an attitude of pride or interest in his ability to do useful things.

The better constructed projects are to be labeled and placed on display in the shop so that visitors and other students may see them and advance comments that often provide encouragement for the members of the class.

Industrial Education Associations, and other organizations sponsor exhibits that allow worthy students to receive commendations for their efforts. This helps to provide a tremendous incentive for good workmanship on the part of the students.

The parent-teacher association welcomes displays of work done in all school classes during the school year. Here again the students have an opportunity to receive praise for their efforts.

Evaluation

Observation for increased efforts on the part of the students may easily be done by the industrial-arts teacher. Notes may be made on the comments by the students.

Objective IX

To acquire exploratory experiences in the field as a means of helping the student in his efforts to choose a vocation which is appropriate for him.

Because of the confusion created as the result of the vast amount of advice given adolescents by adults and because of the many courses of action possible to take in selecting a vocation, there is need for opportunity for students to try out some of these vocations to, at least, get an idea of what they do not like. They may gain experiences which may actually lead to the selection of a vocation.

This effort will require the assignment or selection of a large variety of projects which contain some of the elements of each of the woodworking trades. The pleasant as well as the unpleasant elements should be dealt with by the students.

Projects should be classified in terms of the trade with which they are most closely related.

A visit to some of the construction jobs and woodworking establishments in the community might supplement the experiences gained in the shop.

Evaluation

Effort will be made to determine the extent to which students have been affected by the experiences provided.

Questions

1. Write seven statements about the woodworking trade that you like most.
2. Write five statements about the woodworking trade that you like least.
3. Do you feel that you can succeed in the woodworking trade that you like most?
4. If you should decide upon a trade in this field, what would your first, second, and third choices be?

Objective X

To develop ability to use elementary mathematics required in woodworking.

The amount and price of lumber will be figured by the student before he submits his bill of materials for each project.

Exercises and formulas will be provided by the teacher as follows:

1. One board foot = 1 in. thick by 12 in. wide by 12 in. long. Formula for figuring board feet — *width in inches* × *thickness in inches* × *length in feet.*
2. One square foot = 12 in. wide by 12 in. long. Formula for figuring square feet — *width in feet* × *length in feet.*
3. One cubic foot = 12 in. wide by 12 in. long by 12 in. high. Formula for figuring cubic feet — *width in feet* × *height in feet* × *length in feet.*

The procedures followed in figuring a bill of material will have to be discussed and demonstrated before the class by the teacher.

Evaluation

Students will be asked to do exercises that require an understanding of procedures necessary to figure the above units of measurement.

Learning experiences requiring semester level classification.

In an effort to allow for flexibility in planning, the writer does not attempt to discuss all the details that are necessary for presenting these learning experiences. Therefore, an outline is provided as a guide to more specific planning.

Objective XI

To develop basic skills in the use of woodworking tools and machinery.

First Semester

First semester students will deal with the uses of hand tools only. Teacher demonstrations and student exercises will involve the proper uses of the following: woodworking vise, rule, miter and try square, framing square, marking gauge, claw hammer, crosscut saw, ripsaw, coping saw, wood chisel, mallet, compass saw, backsaw, wood file and wood rasp, jack plane, jointer plane, smooth plane, block plane, brace and bits, nail set, paint brush, pencil.

Suggested Operations: squaring stock, planing stock, butt joint, lap joint, dado joint, spliced joint, boring holes, sawing curves, staining, shellacking, sanding, transfer of patterns.

The following film will be presented and discussed: "Hand Sawing" — 20 min., 16mm., sound, Jam Handy, sets for the fundamentals of handling saws and choosing the right saw for the right job.

Suggested Projects: door stop, hot plate stand, towel holder, letter holder, handkerchief box, folding book rack, plant stand, taboret, book holder, tie holder, candlestick, mailbox.

Second Semester

In addition to the tools listed above, second semester students will deal with uses of the following: sliding T bevel, mortising gauge, turning saw, hack saw, rabbet plane, cabinet scraper, spokeshave, drawknife, countersink, auger bit gauge, screw driver, C clamp, hand screws.

Additional Suggested Operations: blind mortise-and-tenon joint, through mortise-and-tenon joint, gain joint, slip joint, preparing surfaces, applying wood filter, using varnish, using paint.

Instruction sheets similar to the following page may be used as additional guides after teacher demonstrations.

Suggested Projects: side table, kitchen stool and ladder, footstool, serving tray, oval top smoking stand, tool chest, wastebasket.

Finishing

Articles made of wood, must be perfectly smooth before they can be stained, painted, or varnished.

Fillers: There are two classes, liquid and paste. Liquid fillers are best adapted for close grain woods, and to projects that cannot be treated with paste filler, such as intricate carvings. The purpose of fillers is to positively seal the pores of the wood, so that there will be no chance for moisture to get in. Liquid filler is applied with a brush. Cover the entire surface. Before applying a second coat see that the first is perfectly dry, and work down the first coat with steel wool, or very fine sandpaper. This removes the dust particles which may

have settled on the filler while still drying. Never expose liquid filler to the weather.

Paste filler, used on open grain woods, will fill the pores of wood with one application if properly applied. The paste after being worked into a solution with turpentine or gasoline is applied to the wood with a rather stiff brush. Allow the filler to set long enough so that the turpentine or gasoline evaporates. This leaves a thin film of paste spread over the surface. The filler is then worked into the pores by rubbing the surface with a piece of rag or burlap across the grain. Allow the surface to dry thoroughly, and work down with fine sandpaper. Fillers may be applied over any stain or dye. Sometimes the filler is mixed with the stain. Fillers are applied before the wood is shellacked.

Shellac: Shellac is used to seal the wood and to add a gloss. It should be brushed on quickly and should dry free of dust. Rub down between coats with sandpaper or steel wool. Care must be taken not to remove all the stain and shellac from the edges and corners of your job. Use a small piece of sandpaper on the tips of your fingers. Two or three coats of shellac may be needed. Be sure that each coat of shellac is dry and hard before rubbing down.

Rubbing: The final coat of shellac may be rubbed down with a felt pad and some fine pumice stone and polishing oil. A very fine grade of steel wool may be substituted for pumice stone. This kills the glasslike shine and gives a better and smoother finish. Care must be taken to have the shellac dry and hard before rubbing.

Polishing: The job should now be rubbed down with some polishing oil on a soft cloth, such as cheese cloth. Rub down finally with a clean piece of cheese cloth to remove excess oil.

Waxing: A paste made of wax and paraffin may be applied with either a rag or brush. Allow to set until it becomes hard and polish by rubbing with rags or felt.

Varnishing: Varnish is applied to a surface with a brush, but it is allowed to flow with as little brushing as possible. The surface must be properly prepared before varnishing is attempted. Before another coat is applied allow at least 36 hours to dry. By rubbing down with pumice stone and felt, or rubbing with a rag and oil, we obtain a dull gloss or a highly polished surface. All varnishes are not the same.

Third Semester

The following additional tools and machines will be studied.

Tools: spirit level, miter box, inside calipers, outside calipers, plumb bob, steel bar clamps, hand drill, T square, drawing board, triangles and French curve.

Machines: drill press, circular saw, band saw.

Additional Suggested Operations: dovetail joint, haunched mortise-and-tenon joint, slip joint, miter joint, slip miter joint, finger joint, and the doweled joint.

Suggested Projects: clothes hamper, crickett (holland type), coffee table, typing table, modern end table, colonial type reading lamp, folding snack table.

Fourth Semester

The following additional tools and machines will be studied.

Tools: wood turning chisels, saw file, saw clamp, saw set, carving tools.

Machines: jointer planer, woodturning lathe, grinder.

Suggested Operations: panel structure, spline miter joint, turned table legs, shiplap joint, carving beads, inlaying insets, cutting tapers, sharpening and setting saws.

Suggested Projects: Roman hassock, bedside table (turned legs), dining room chair, student desk, model house.

Evaluation

The teacher will inspect each project — judging workmanship and finish. A set of standards must be followed in this undertaking.

The following films will be presented and discussed:

"Essential of Woodturning," 1 reel, 16mm., Calhoun Film Distributors.

Two high school teachers in charge of visual aid and vocational training, collaborate in a well-made film on operation of a simple wood lathe, by scraping method, and show the usefulness of knowledge of woodworking machinery.

"Planing Rough Surface to Dimensions," 17 min. 16mm. sound, U. S. Office of Education.

Depicts adjusting the table for desired thickness; how to set feed rolls for proper speed; how to feed with the grain; how to surface short pieces and glued stock.

Objective XII

To develop ability to identify and evaluate the general characteristics of materials used in woodworking.

This objective may be attained to some extent by labeling each material used in the shop. The student learns to associate names with certain materials. He learns some of the characteristics of materials by working with them.

Additional instruction may be presented through the use of posters and sample materials labeled and placed where the students can see them.

Evaluation

Students enrolled in the fourth semester course are required to select the materials necessary to construct their projects. The teacher can check their selections to determine their abilities in this area.

Summary

Industrial-arts education, at its best, is informational, inspiring, stimulating, and exploratory. Its function is to help pupils develop an appreciation of materials and processes of industry, and the relationship of industry to our modern society. It provides for guidance in the selection of vocations and avocations; and it gives aid to the development of attitudes toward world activities and the part that men, as individuals, play in them.

This is a broad program which includes the exploration of world wide industrial practices. In order to provide for the necessary learning situations in the classroom, the teacher uses many instructional materials and techniques — including verbal material, teacher demonstrations, visual and audio-visual aids, and laboratory practice.

The motion picture is a relatively new technique used to provide concrete experiences that help to clarify much of the verbal material which is used in classroom instruction. It can create a lifelike situation, and help the learner to perceive the peculiarities of many industrial processes. It has been found useful in stimulating motivation, arousing interest, initiating action, creating desire, and disturbing the complacency and the indifference of the learner.

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Problems and Projects

Professional Design in School Shops

ALEXANDER F. BICK
Teacher in Milwaukee Schools
The Milwaukee Downer College
Milwaukee, Wis.

A discussion of shop design in answer to questions frequently asked.

What About Design?

It has been repeatedly urged in this series that industrial-arts teachers be professional in their understanding of project design.

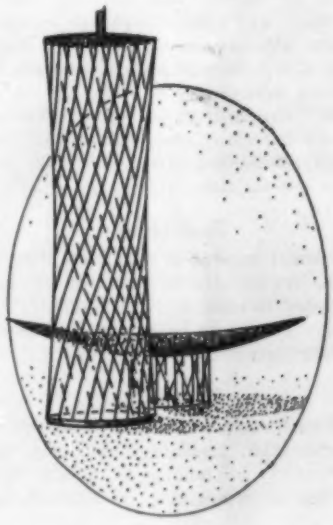
Where there are projects, there must be design. This is axiomatic. In industry, design goes hand-in-hand with preliminary engineering.

But, what design shall there be in schools? Obviously the school should use professionally sponsored design — right design. There also is wrong design, and this design has no right in schools. Wrong design actually is waste knowledge. Contemporary style is fit for our contemporary age. Other types are either obsolete, in poor taste, amateurish, or trash.

The question may be asked, "What is the formula by which trash design may be identified? Who can say that such and such is trash design?"

There is so much insecurity in the school shop design area, that it is appropriate at this time to answer this sincere question. Clearing up the muddle that has been built up around the question of proper design is a matter within the ability of every teacher.

Let us begin by looking critically at the subject of *trash* design. Trash design is



hypocritical design. It may claim to be modern or classic, and may even have certain features which might identify it as an effort to be modern or classic, but if it is based on a misunderstanding of the essentially true forms established by authority for these periods, it is counterfeit.

Since teacher discrimination is at low ebb, it may be said that teachers do not know what professional design is. Some wish to know but are bewildered as to the method of obtaining the know-how. There are other reasons, not as defensible, but let us accept the fact that most teachers are sincerely desirous of a professional design knowledge. The question then is "What is professional design, and who says it is or is not professional?" and since this is a key question it is quite obvious that there cannot be a satisfying package answer given to these questions. Hence, our answer must be:

a) Accept the given formula with tentative faith.

b) Try to acquire personal experience.

After having spent fifty odd years in design, it is no problem to identify quality design. A soldier can identify the general from the sergeant, and the wife can identify real quality dress material from the gaudy stuff her spouse may fall for, and her simple explanation may be "I just know by long association." The man shrugs, and learns no more. She thinks "He never learns because he will not condescend to learn."

Much faith is necessary at the beginning. For instance,

a) There is design authority. Top industrial designers such as Raymond Loewe and Walter Dorwin Teague; top furniture designers such as George Nelson of Miller Furniture Company, Paul McCobb of Directional Furniture, Charles Eames, Florence Knoll, and others of Knoll Assistants; top architects such as Frank Lloyd Wright, Marcel Breuer, Ludwig Meis von der Rohe, giving but a few names in each category. There are many others.

b) There is further authority in top professional journals whose paid special editors are among the nation's best authorities on design. They select and report on quality work. With these are a group of individuals who spend their lives with highly esteemed design. They are art museum directors and specialists, such as those at the New York Museum of Modern Art, Walker Art Center of Minneapolis, etc.; also those in interior decorating professions; and those in design schools. Their professional journals are: *Interiors Magazine, Design Quarterly* (Walker Art Center publication), *Craft Horizons, Furniture Forum* (quarterly), and some others, including architectural magazines.

c) This authority is accepted by the profession generally, i.e., by top interior designers, furniture designers, industrial designers, and architects accept this authority.

Recognition is by the profession itself. It is well, therefore, to accept the recognition on faith until there is opportunity to prove the worthiness of the recognition and the truth of that for which they stand. Members and officers of professional associations will quickly name the top authorities in their fields, who have won acclaim and standing in the area of their creative work. These receive periodic and continued recognition in professional journals, and such reporting finds its way into the special and general reading and discussion of mature people. These accept the report, not merely because of its authentic source, or of the fame of the reporting specialist, but also because it fits into the pattern of that which they have previously gathered or already known. It thus becomes common knowledge to an alert group of cultured individuals, who in many instances enjoy the place of leadership in many fields. If radically new work is not immediately accepted by this group, and yet, if it has the nod of a known master, and then a small upper level group, it is studied by the group, and as its ground philosophy is understood, it is taken as a new aspect to be adjusted to. The point, in this section of *faith* should now be clear. Living with an idea or with a thing makes the one who associates long and intensively, an authority. Those who spend their lives with an idea can tell an off note from a true with bewildering skill. To them, it is life, not skill. An engineer, the other day, stood outside his Diesel and smiled while a little boy explained to his father what made the locomotive tick. The father seemed interested, but if he had been, he could have tapped high authority in the person of one whose life was spent in company with the object of question. Association makes one conscious of the refinements of any knowledge.

Below the group of understanding people are those who do not condescend to learn and experience the refinements of life. This then answers the question "Who are authority?" Teachers belong to the mature group if and when they consort with those who live with authority.

d) Personal experience. It has been said that learning and knowing is the result of association with authority. Our answer to the question, "What is professional design, and who says it is professional," was given as (1) tentative faith; and (2) personal experience. In the following paragraph is given the practical formula by which all the answers relating to school shop design can be found with ease. Here is the formula. Follow carefully.

Gaining the professional design know-how is like knowing Bill Jones, just by common, everyday, down-to-earth, hanging around with him. In this case, it would be a matter of hanging around with authentic design on its own location, i.e., the professional magazine. No real learning takes place until there is close association with top authority. The contact requires an investment of time and energy, most of which is used in overcoming the first inertia. From there on it is a pleasure.

Tools: One of the named professional magazines, paper, and soft pencil.

Location: A quiet, pleasant spot, alone.

Plan: Weekly, bimonthly, or monthly, makes no difference, but the session must not fail. The learner must at least be faithful to his first intent. So we will say at regular intervals, faithfully, and intently.

Method — First Stage: Page through the professional magazine. Pay attention only to contemporary work. Get into the *feeling* of it. See it as a whole effort, the work of a profession. What is there similar about all contemporary design? Let this be the program for several months.

Second Stage: Page through as before. Notice names of designers, builders, and writers. Write on the cover to identify work of interest, the work of an artist, and other references. Read a little. Read at least the opening and closing paragraphs of important articles. You will detect from the manner of handling, what importance was given the article by the editorial staff.

Third Stage: Page through this, and if available, other high level professional magazines or publications, if for nothing else than for comparison. Read a little, as before, and sketch a little. Go through the magazine to list the methods of supporting tables, and see what there is of unity in the approach to the table leg problem. There are a few standard approaches, and there are a number of interesting and creative exceptions. Make all sketches roughly, and record in what manner similar systems bring in variety. Note the reserve and the simplicity in the work of the best designers. Next month, study case furniture design. Note moldings, doors, leg placement, the element of refinement, etc.

In other months, study chairs, small furnishings, etc. Visit, in the meantime, an interior designer's display to see the pieces firsthand. As time goes on, intensify your research, speak to interior designers. Get the feeling in their showrooms of interrelationships between contemporary furniture, lighting, floor coverings, fabrics, and wall coverings. Look particularly at furniture coverings; also at pottery, and at small fittings. See how they all *belong* together.

This will be an amazing revelation to the ones who try it.

Do not expect design to be static. Design is life. It is continuously evolving. What is *design* today will be outgrown in a short span of time, depending upon conditions in the world and upon the energy and product of individual creators. The point is, a teacher should follow the formula given, and thereafter, he must keep himself in the stream of creative endeavor by continued follow-up.

The education derived from applying the formula will be invaluable, as well as low in cost, even though the teacher must furnish his own resource material. Of course, his school library may have the material, but if he owns it, it will double his progress toward the day when he has gained the designation which time will confer — the teacher with the professional designer's outlook, an authority on school shop design.

His work will then take on a new brilliance because he has the *far view*, a view that is stimulating and vital. His students will gain; his school will gain; and with enough like him, education can hope to build a renaissance in America.

BRUSH HOLDER

LEONARD HASKELL
Shop Instructor
High School
Baker, Mont.

By keeping a shellac brush submerged in alcohol when not in use, it is not necessary to clean the brush each time it is used. The brush holder here illustrated will keep a brush in alcohol, and at the same time keep the alcohol from evaporating. A similar brush holder can be used with turpentine for varnish. Care must be taken,

however, that the brush stored in alcohol is always used in shellac, and the brush in the turpentine used with varnish.

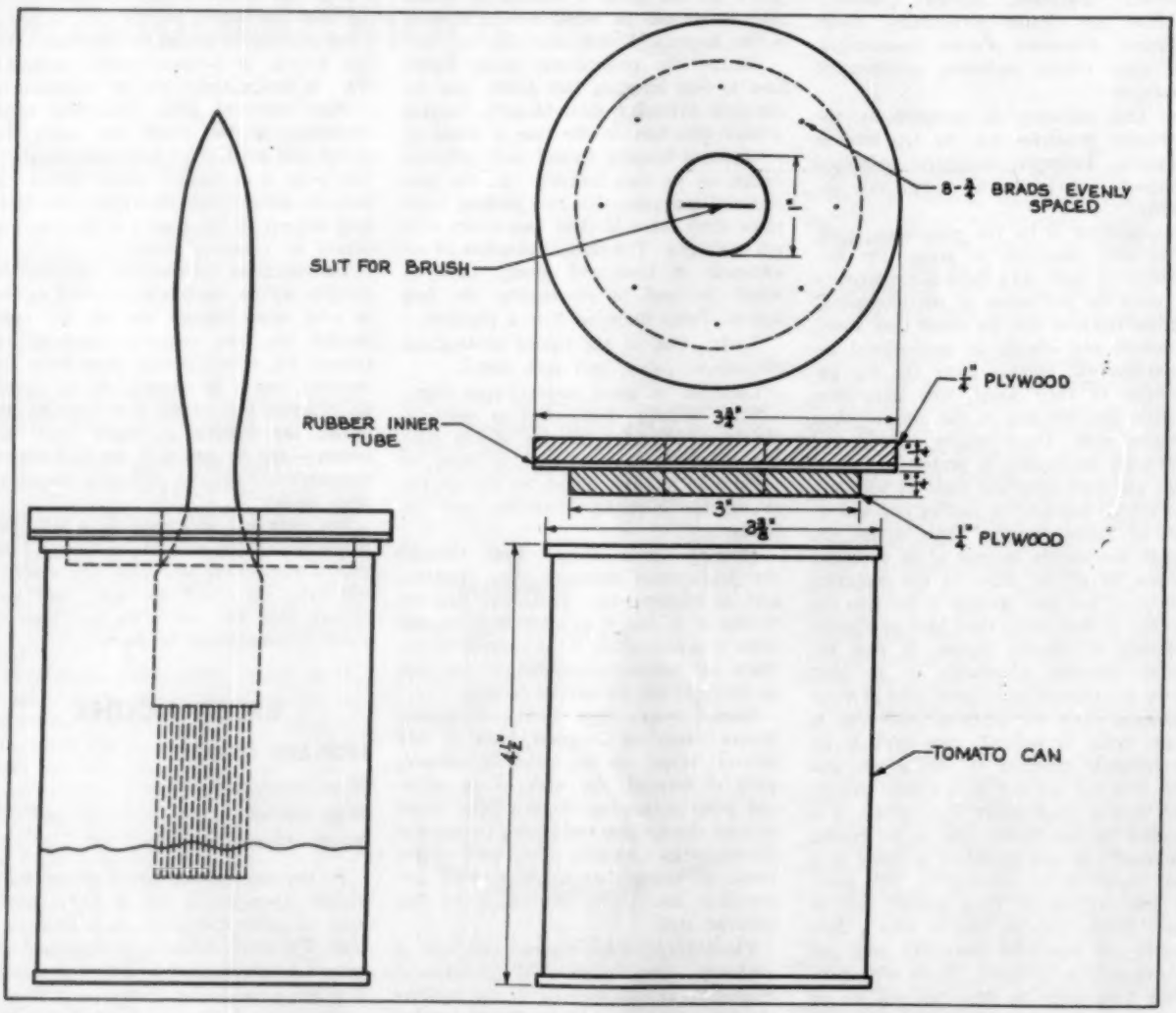
The only materials needed in making a brush holder are two pieces of ¼ in. plywood 3¾ in. in diameter, a piece of rubber inner tube cut 3¾ in. in diameter, ¾-in. brads to hold the cover together, and a tomato can. Bore a 1-in. hole in the center of the pieces of plywood, and cut a slit in the rubber for the brush to pass through.

If several students use shellac or varnish at the same time, increase the number of brush holders.

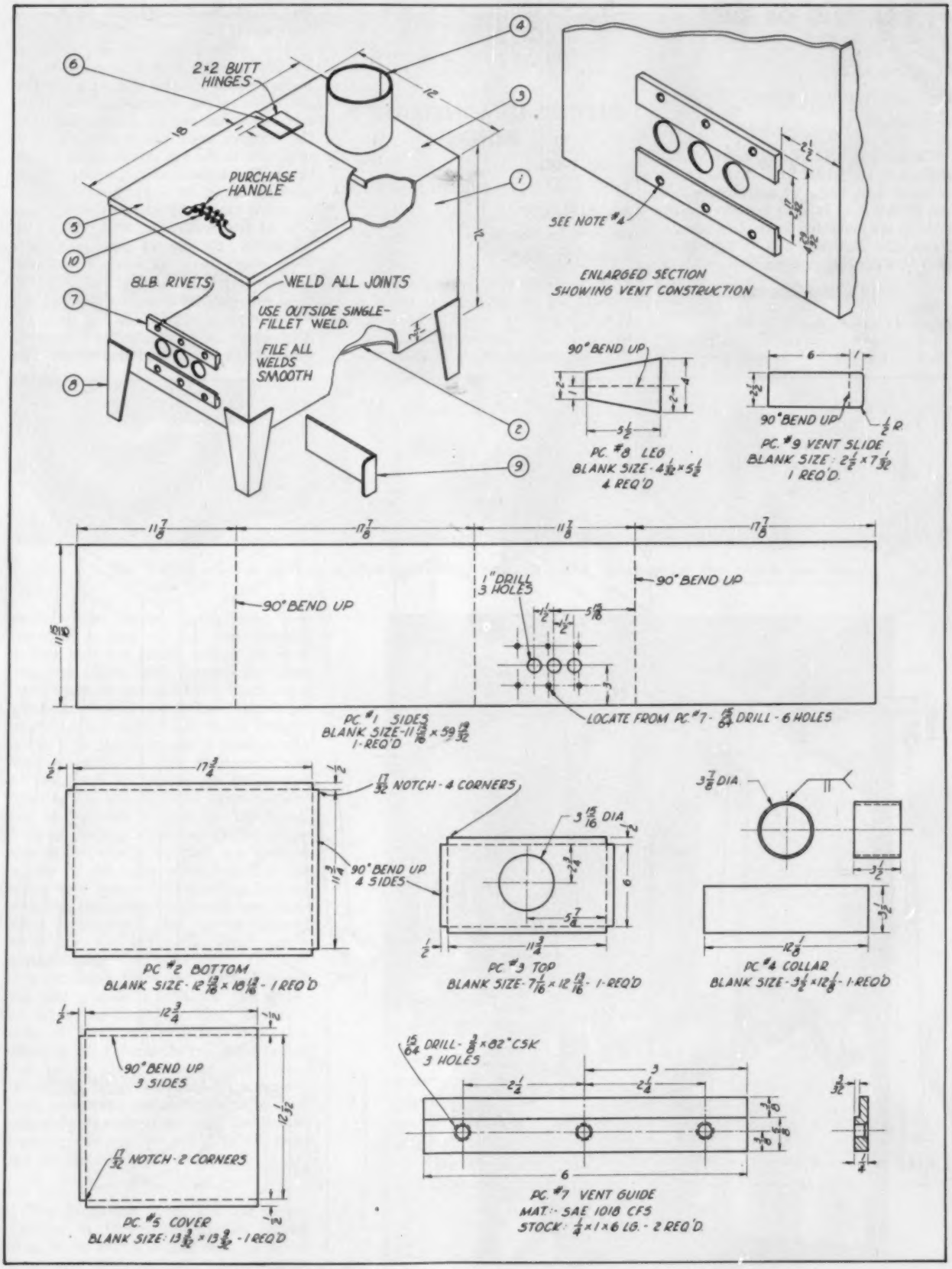
The handy brush holders in use

Shop, Look and Listen . . . "Bed project by that new exchange student from India!"

— Al Marino, Pennsylvania Training School, Canonsburg, Pa.



Detail drawing of the brush holder


2×2 BUTT HINGES
PURCHASE HANDLE
8LB. RIVETS
WELD ALL JOINTS
USE OUTSIDE SINGLE-FILLET WELD.
FILE ALL WELDS SMOOTH
SEE NOTE #4
ENLARGED SECTION SHOWING VENT CONSTRUCTION
90° BEND UP
PC. #8 LEG
BLANK SIZE - 4 1/32 × 5 1/2
4 REQ'D
90° BEND UP
PC. #9 VENT SLIDE
BLANK SIZE: 2 1/2 × 7 1/32
1 REQ'D.
90° BEND UP
1" DRILL 3 HOLES
LOCATE FROM PC. #7 - 25/64 DRILL - 6 HOLES
PC. #1 SIDES
BLANK SIZE - 11 13/16 × 59 13/32
1 REQ'D
11/32 NOTCH - 4 CORNERS
90° BEND UP 4 SIDES
PC. #2 BOTTOM
BLANK SIZE - 12 13/16 × 18 13/16 - 1 REQ'D
3 15/16 DIA
PC. #3 TOP
BLANK SIZE - 7 1/16 × 12 13/16 - 1 REQ'D
3 7/8 DIA
PC. #4 COLLAR
BLANK SIZE - 3 1/2 × 12 1/8 - 1 REQ'D
90° BEND UP 3 SIDES
11/32 NOTCH - 2 CORNERS
PC. #5 COVER
BLANK SIZE: 13 3/32 × 13 3/32 - 1 REQ'D
15/64 DRILL - 3/8 × 82° CSK 3 HOLES
PC. #7 VENT GUIDE
MAT.: SAE 1018 CFS
STOCK: 1/4 × 1 × 6 LG. - 2 REQ'D

Camp stove by Walter H. Harrington, Head of Engineering Drafting, New Hampshire Technical Institute, Manchester, N. H.

DRAFTING OR SHOP STOOL

Percy Martins
Berkshire Industrial Farm
Canaan, N. Y.

The stool shown herewith makes a useful addition to the school shop, drafting room, or home workshop. Carefully constructed, and given a good finish, it becomes a useful table in the home for lamps, telephone, or plants. The stool may also be successfully used as a drafting problem.

BILL OF MATERIALS

No. Required	*Name of Part*	*Size*
4	Leg	1½ x 1½ x 30 in.
2	Top rail	¾ x 3 x 10½ in.
2	Top rail	¾ x 3 x 6½ in.
2	Bottom rail	¾ x 3 x 12½ in.
2	Bottom rail	¾ x 3 x 8½ in.
1	Top	¾ x 11 x 15 in.
1	Shelf	¾ x 11 x 15 in.

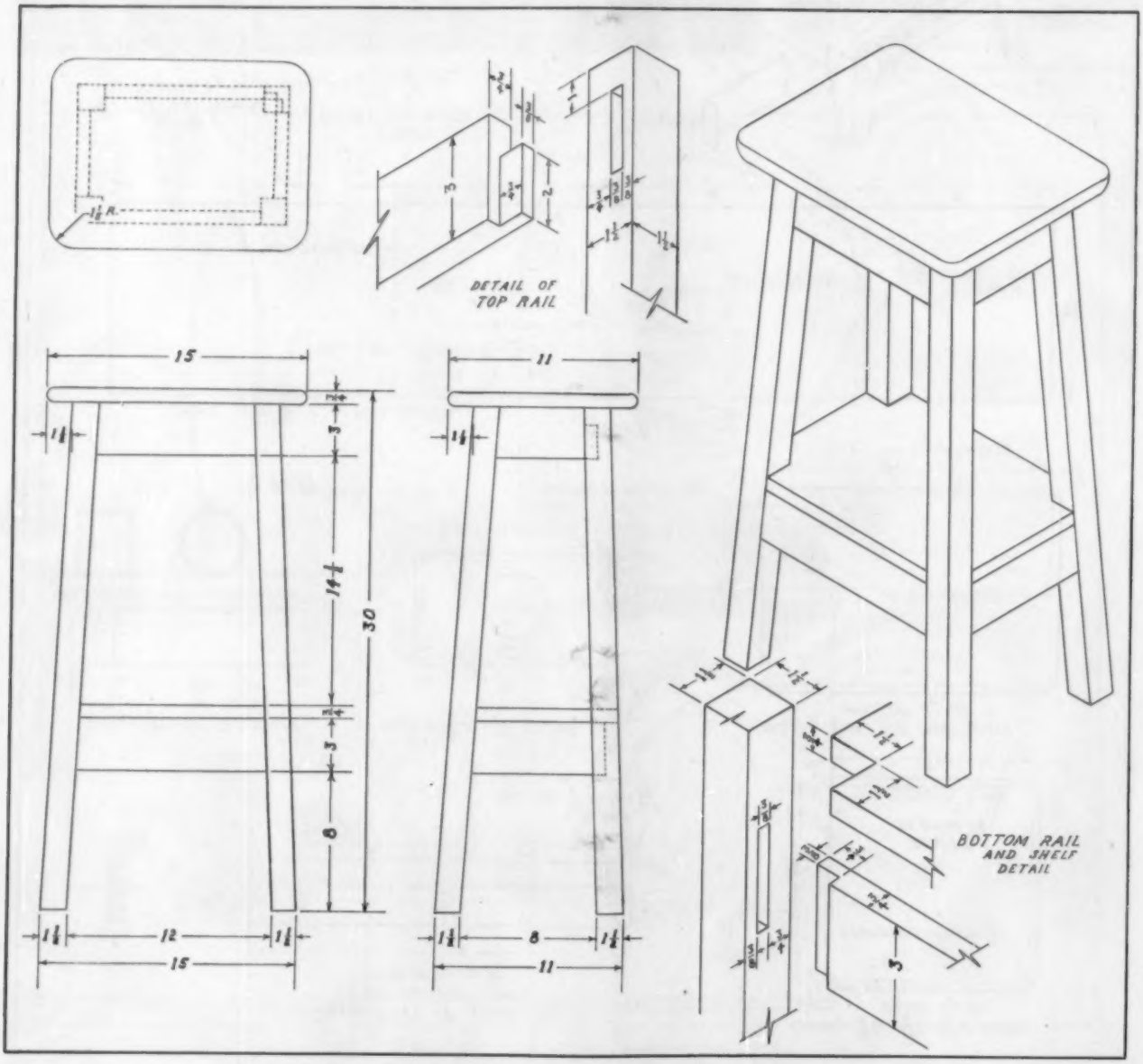
TILT-TOP DEMONSTRATION BENCH

J. W. WEEKS
Critic Teacher, Post Junior High School
MICHAEL LOFTUS
Student Teacher
Dearborn, Mich.

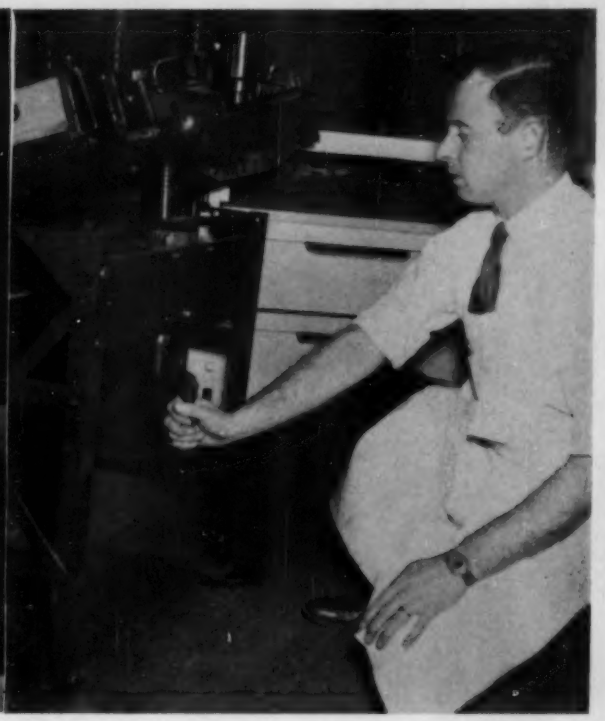
The problems involved in giving demonstrations are numerous. In the Junior High School, classes of 30 to 40 students are not uncommon. In such a situation as this, the main problem of instruction is that of placing the students so that all may see.

Many methods have been used to alleviate this situation. One method is the use of the so-called *bleacher* type seats. Another is the use of an overhead mirror. However, each has certain disadvantages. In the bleacher seats, the students have a poor view of the top of the demonstration bench. This is particularly important when teaching layout on actual materials; and, in many cases, the more benefiting top view of tool techniques. With the use of the mirror, the line of sight is farther. Two images must be watched, and the mirror image is in reverse.

In order to help solve this problem, the tilt-top demonstration bench was designed. This bench is a standard woodworking bench that has been slightly modified. The



Details of the drafting or shop stool by Percy Martins



The bench in use during a demonstration; and at right, mechanism for tilting the bench

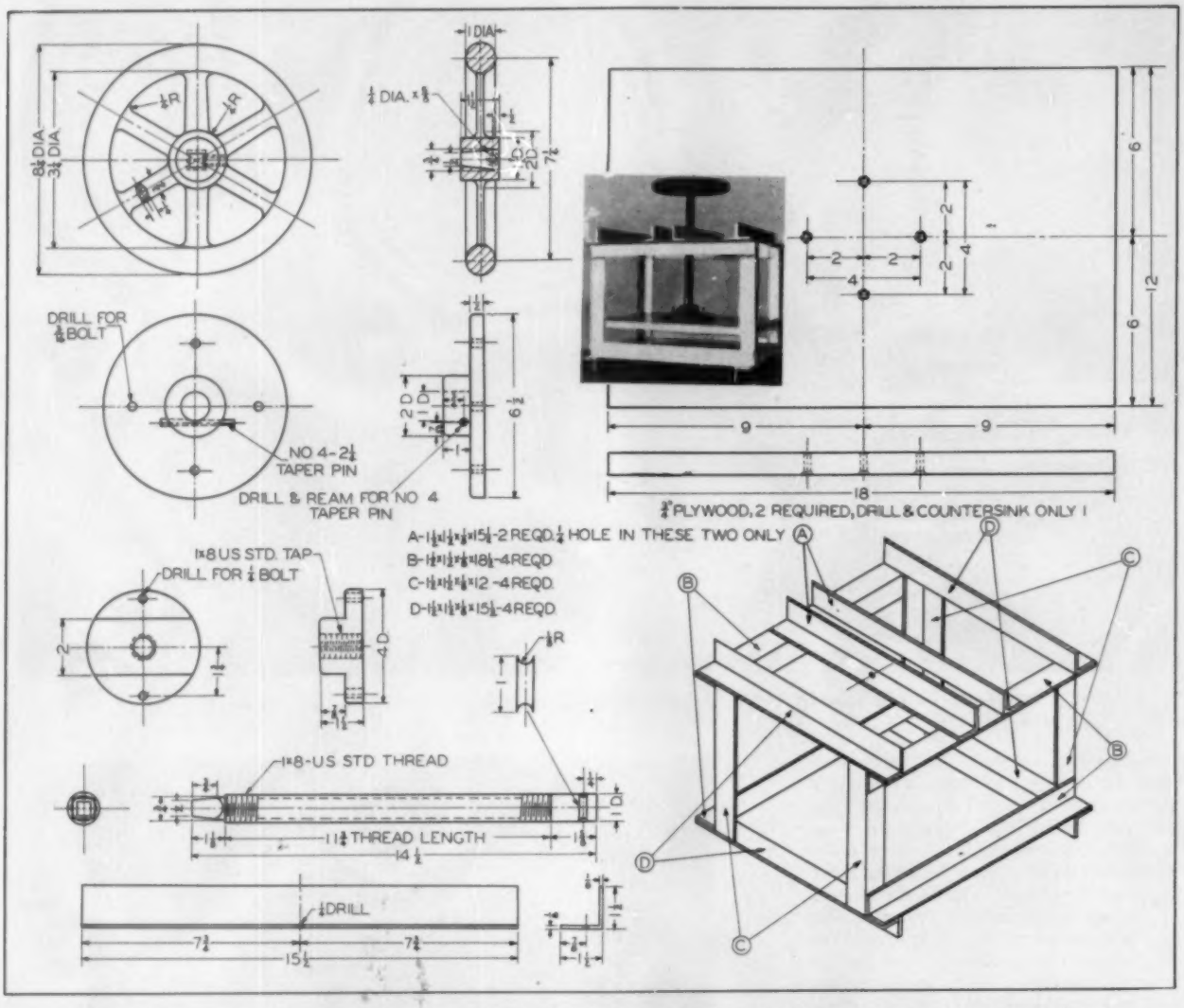
rivets holding the top to the frame were removed. A long rod that was threaded at both ends was passed through the front two rivet holes. This formed the hinge upon which the top could tilt. Extra cross-pieces were added to each end of the bench to restore lost rigidity due to the removal of the top. A screw from a woodworking vise was bolted to the instructor's side of the bench to provide for raising and lowering the top. In order to protect the top and provide a skid for the screw, a metal plate was fastened to the underside of the top. A lock rod was inserted in one of the holes remaining after the rivets were removed to discourage playing with the bench and to prevent the possibility of accidents. This can be removed when the top is to be tilted for a demonstration.

A removable fence was attached to the top and provide a skid for the screw, off when the bench is tilted. This is a strip of hardwood with two steel pins which fit into holes in the top of the bench.

A rolling utility table or cart placed beside the bench will hold all necessary tools, equipment, and materials to be used during the demonstration. After the demonstration, this can be easily rolled away and the tools, etc., put away.

The Army had about 130,000 motor vehicles in World War I. In World War II it had a motor fleet of more than 1,500,000. — *Public Information Office.*

Tilting demonstration bench



Darkroom press. Details of construction and the finished project. This darkroom press was made to flatten photographs and has been quite useful. It develops enough pressure to be used as a bookbinding press, and is much lighter than a typical binding press made of castings.

—John Emmel, Connelley Vocational High School, Pittsburgh, Pa.

DRAFTING PENCIL—A TEACHING AID

STANLEY ROSS
East Whittier Jr. High School
Whittier, Calif.

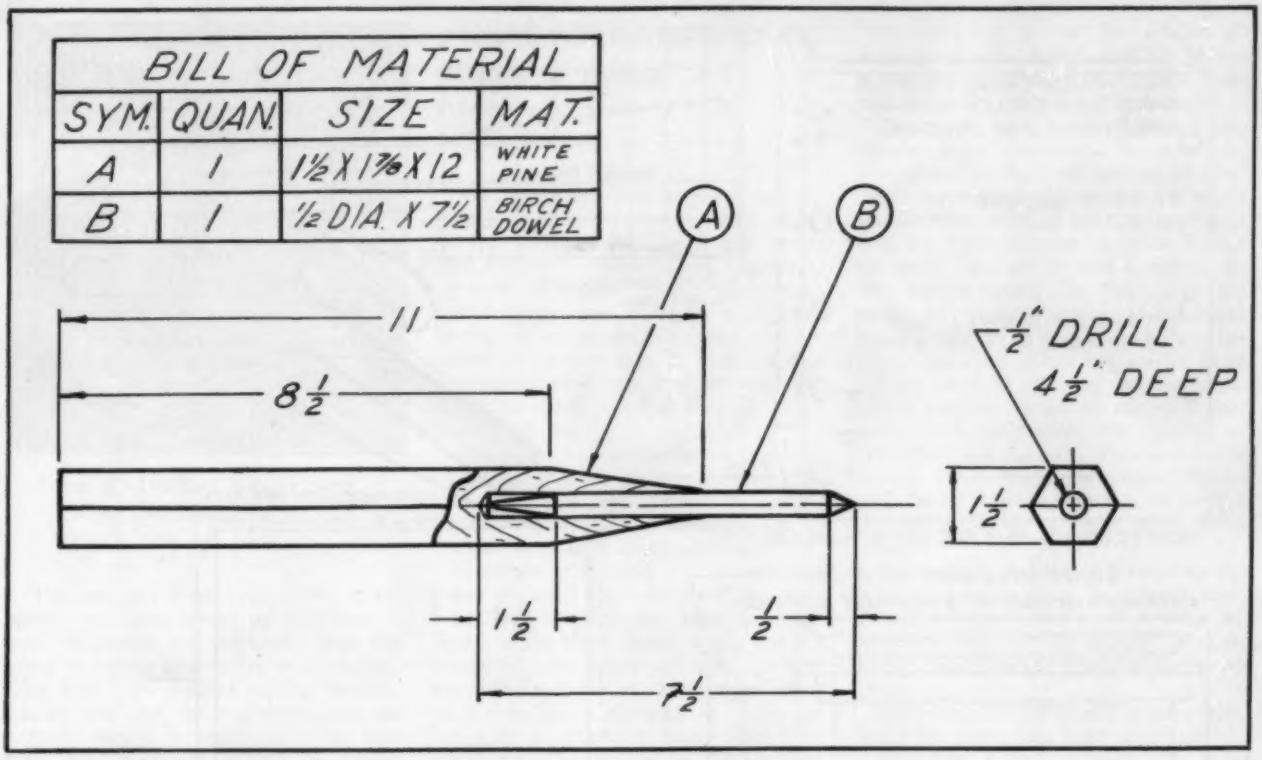
How can we teach beginning drafting students to point and use their pencils correctly? Here is a teaching aid that has been very helpful in teaching students the correct care and use of drafting pencils.

The body (part *A*) of the pencil is made out of a piece of 1½ by 1⅜ by 12 in. white pine wood. By tilting the blade at an angle of 30 deg. on a table saw one can cut the hexagon shape of the body. Surfaces that have been sawed can be made smooth with a hand plane. The tapered end of the pencil body can be turned on a wood lathe. A ½-in. hole 4½ in. deep should be drilled in the tapered end on a drill press.

Teaching aid for the drafting room

The point or lead (part *B*) of the teaching aid can be fashioned out of a piece of ½-in. birch dowel 7½ in. long by chucking it in a drill press and filing it as it rotates. One end of the dowel should be filed to a long conical point, while the other should be blunt. An alternate part *B* can be made to illustrate the chisel point.

After sanding the body *A* of the pencil, two coats of clear lacquer can be applied. A coat or two of light blue, green, or yellow enamel applied to the hexagon flats and painting H's in a contrasting color on alternate flats of the body will give it a likeness of a standard drawing pencil. The lead *B* should be painted one coat of flat black.



Details of the drafting pencil

In using the teaching aid one can show with the blunt point how a pencil looks as it emerges from a drafting pencil sharpener. With the sharp point exposed one can show how to point a drafting pencil and how it should look with a long slender point. The model pencil can also be used to show the correct technique for drawing lines with a pencil and straight edge, irregular curve, and templates.

Oldest National Guard unit is the 182nd Infantry of Massachusetts, organized as a militia outfit back in 1636.

COPPER TRIMMED HUMIDOR

DICK HUTCHINSON
San Gabriel, Calif.

This copper trimmed tobacco humidor and separate copper pipe rack is made to set on the desk or table alongside the humidor to hold the pipe upright and keep from spilling tobacco all over the place.

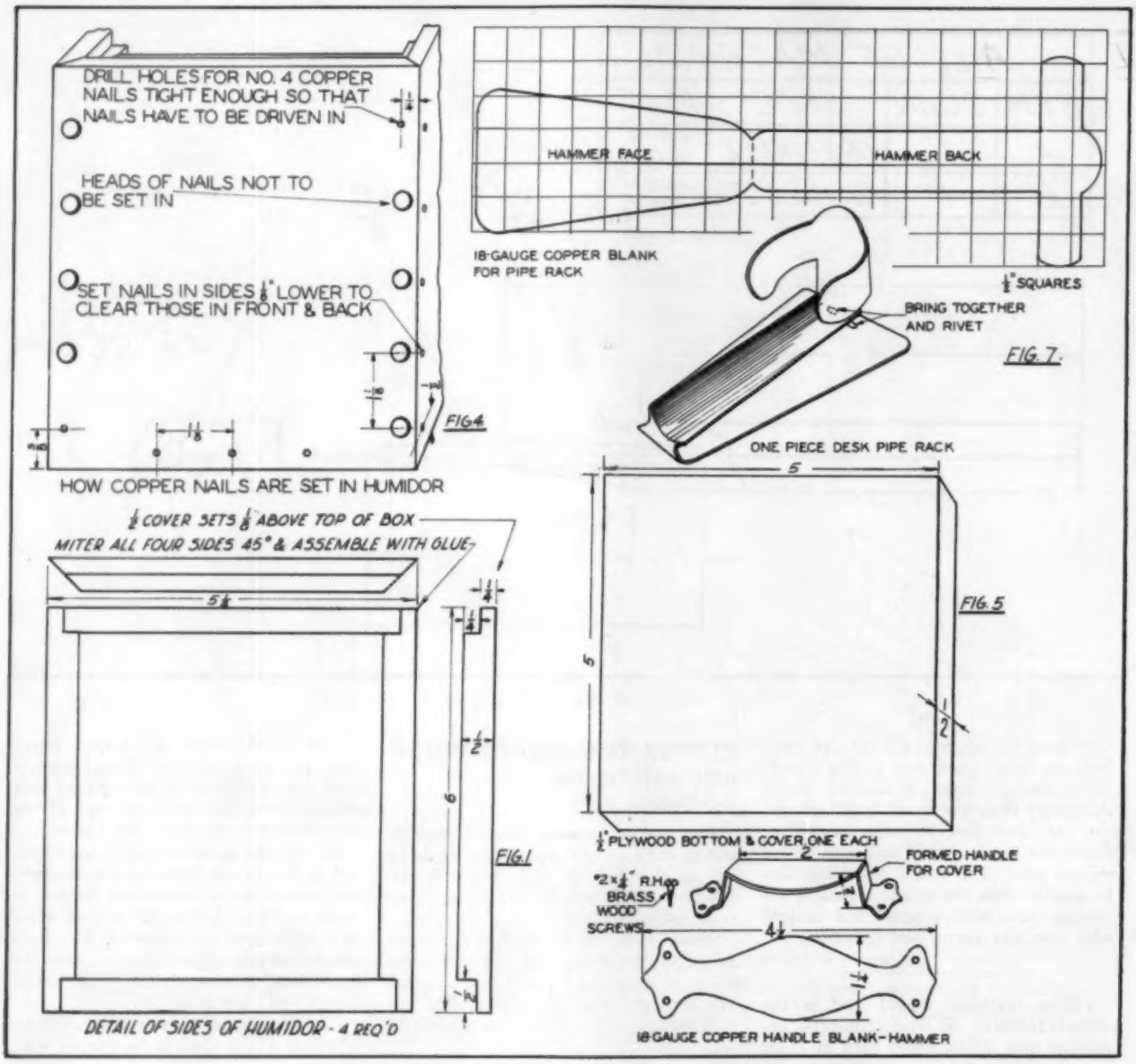
Select ½-in. fir plywood that has an attractive grain and cut the four side pieces as shown in Figure 1. Use a bench saw for cutting in the rabbets. The corners are mitered at 45 deg. for assembling with glue.

Next cut the cover and bottom pieces from the same material. Then, using a wood carver's gouge carve out the soft white grain on the outside of each of the side pieces and the cover. See Figure 2.

Set the box up as it will be assembled, with both top and bottom pieces in place, and tack a frame around the bottom as shown in Figure 3. Coat the mitered edges with liquid glue and assemble, with both top and bottom pieces in place to keep the box square, and clamp tight with parallel clamps and allow it to dry.

Glue the bottom in, then drill as shown in Figure 4, and drive in the copper nails.

Fig. 2. Carving out the soft white grain in the plywood sides. Fig. 3. Nail a wood frame around the box to hold it when assembling, then clamp tight both ways with parallel clamps


DRILL HOLES FOR NO. 4 COPPER NAILS TIGHT ENOUGH SO THAT NAILS HAVE TO BE DRIVEN IN
HEADS OF NAILS NOT TO BE SET IN
SET NAILS IN SIDES 1/8" LOWER TO CLEAR THOSE IN FRONT & BACK
FIG4
HOW COPPER NAILS ARE SET IN HUMIDOR
1/2 COVER SETS 1/8 ABOVE TOP OF BOX
MITER ALL FOUR SIDES 45° & ASSEMBLE WITH GLUE
5 1/2
1/4
1/2
6
FIG1
DETAIL OF SIDES OF HUMIDOR - 4 REQ'D
HAMMER FACE
HAMMER BACK
18-GAUGE COPPER BLANK FOR PIPE RACK
1/2" SQUARES
BRING TOGETHER AND RIVET
FIG. 7.
ONE PIECE DESK PIPE RACK
5
5
1/2
FIG. 5
1/2" PLYWOOD BOTTOM & COVER ONE EACH
2
FORMED HANDLE FOR COVER
#2 x 1/2" R.H. BRASS WOOD SCREWS
4 1/2
18-GAUGE COPPER HANDLE BLANK-HAMMER

Figs. 1, 4, 5, and 7. Detail drawing of the copper trimmed humidor with separate pipe rack

Fig. 6. Completed humidor and the pipe set in the pipe rack. At right, Fig. 9. The completed pipe holder

The heads of the nails should be polished before using.

Give the inside of the box two coats of white shellac, and the outside should be given one coat of the shellac. When dry, paint over all exposed surface with dark brown semigloss oil paint and wipe dry immediately. This will expose the grain and leave enough of the paint in the carved out sections to bring out all of the beauty of the grain.

Make the handle, Figure 5, of 18-gauge soft sheet copper. Heat lightly until it begins to change color, then buff just enough to make it shine. Lacquer, and attach with r.h. brass wood screws to complete.

Fig. 8. Loading a pipe from the humidor

The pipe rack is cut from a strip of 18-gauge soft sheet copper as in Figure 7, and hammered as indicated; then the piece is heated until it begins to darken, then buff it as directed for the humidor handle. The pipe rest and the upright are formed around a length of ½-in. iron pipe and the upright is bent up sharply and the two wings are adjusted to fit the pipe that it will support, after which the base is bent around and under. A hole is drilled as shown, and the rest is riveted to the base with a single brass or copper rivet. The finished pieces are shown in Figures 8 and 9.

SHEET METAL BIRDHOUSE

HERBERT W. YANKEE
High School
Stratford, Conn.

The sheet metal birdhouse has been designed to withstand the damaging effects of the weather. Experience has proved that a wood birdhouse in use, exposed to all kinds of weather, usually needs repair and painting every three or four years. Because of its inaccessibility, this may not always be an easy task. It is known that a galvanized or aluminum object will withstand the elements better than an object made from wood.

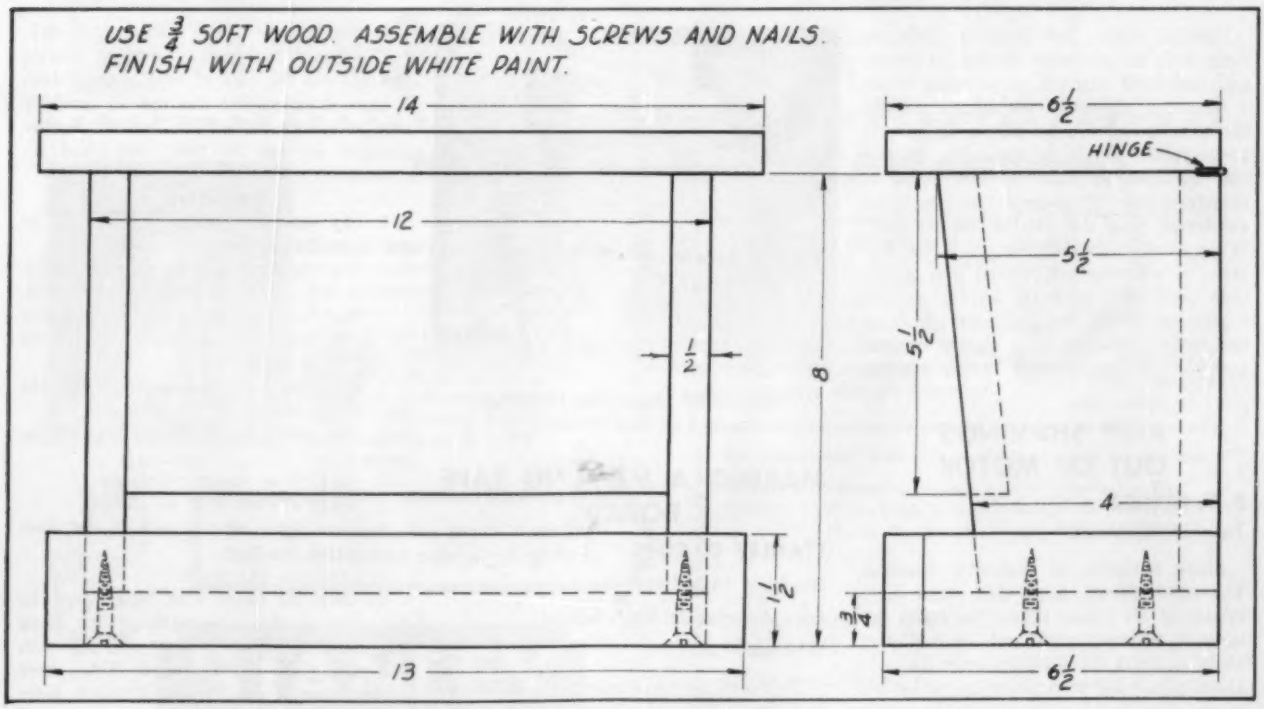
The sheet metal birdhouse was developed with these thoughts in mind. The hole opening is large enough to accommodate most birds who normally are attracted to artificial living quarters.

A pattern or template of the piece that forms the sides and ends should be made first. This template can then be transferred to the stock. When laying out the template, care should be given to the placement and size of the six tabs, three on a side, which are used to fasten the top to the lower section. Sheet metal drive screws are recommended for the assembly of these parts. The entrance hole, and all holes for the screws and rivets should be made before bending to shape. Be sure to provide stock for a ½-in. fold at one end of the layout. Note the position of the fold. It goes inside the house thereby assuring a neat and square corner. The ends form the pitch of the roof. When all holes have been drilled and the outline cut to size, insert the stock into the brake and bend the corners to right angles.

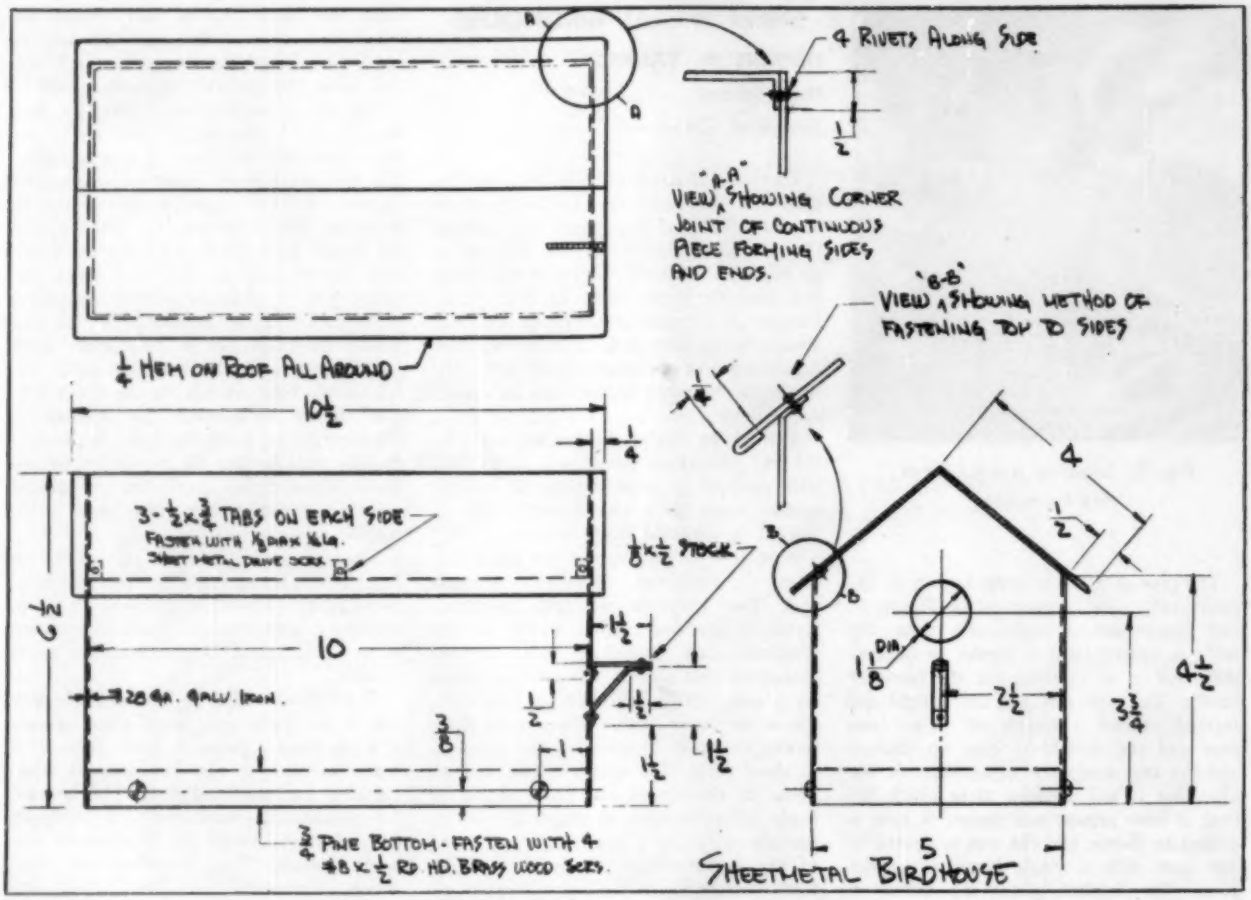
The top is made from a sheet of rectangular stock, dimensions: 8½ by 11 in. This allows for the ¼-in. hem on all sides. The hem is suggested because of the safety feature when fastening the top and also in installing the birdhouse. A ¼-in. square cut should be made at each corner of the roof before folding the hem along the edges. This is done to prevent the metal from gathering or bunching due to the double thickness. After the correct bend for the pitch of the roof has been obtained, position the top on the lower section. Reach up through the opening at the bottom and mark the holes in the tabs thereby transferring their position to the roof. These holes may then be drilled prior to installing the sheet metal drive screws.

The bird stand, which is riveted to the front of the house below the entrance hole, is made from a piece of stock ⅛ by ½ in. aluminum. This may be fastened in place at any time prior to attaching the wood bottom.

The bottom, which is held in place with No. 8 by ½-in. r.h. brass wood screws, is made from a piece of ¾-in. pine. It is made so that it can be removed when cleaning out the birdhouse. The bracket for installing the birdhouse to a tree, post, or structure, should be attached to the wood bottom. Thus, in effect, the birdhouse is removed from the bottom and cleaned in this manner.



Bird feeding station by Louis Barocci, High School, Cudahy, Wis.


4 RIVETS ALONG SIDE
VIEW "A-A" SHOWING CORNER JOINT OF CONTINUOUS PIECE FORMING SIDES AND ENDS.
VIEW "B-B" SHOWING METHOD OF FASTENING TOP TO SIDES
¼ HEM ON ROOF ALL AROUND
10½
3-½x¾ TABS ON EACH SIDE
FASTEN WITH ½ DIA. NO. 6 SHEET METAL DRIVE SCREWS
⅛x½ STOCK
10
#28 GA. GALV. IRON.
¾ PINE BOTTOM - FASTEN WITH 4 #8 x ½ RD HD. BRASS WOOD SCRS.
SHEETMETAL BIRDHOUSE

Details for constructing the sheet metal birdhouse

Careful study and research indicates birds have no particular dislike for houses with reflective surfaces so painting is not a necessity. However, should the builder desire to paint the birdhouse, a coat of metal primer should be applied to all outside surfaces followed by two coats of outside paint. Priming is necessary on galvanized iron due to the zinc coating. When paint is applied directly to the surfaces of untreated galvanized iron it will soon crack and peel off. To further add to the ability of the paint to adhere to the surface, the surfaces should be well sanded with emery cloth before priming.

KEEP SHAVINGS OUT OF MOTOR

E. V. REYNER
Townsend, Mont.

Shop students of Kenneth Goodian, Townsend, Mont., made this stand for a jointer in his school shop. The stand features a plywood panel set at a 45-deg. angle to direct the shavings away from the motor which has been placed in the bottom of the stand and is connected to the jointer with a V belt.

This stand keeps the shavings out of the motor

MAKING A MASKING TAPE BOARD

STANLEY D. ROSS
Drafting Instructor
East Whittier Jr. High School
Whittier, Calif.

This masking tape board was developed in a junior high school drafting laboratory in which six classes of twenty students meet and pursue their studies each day.

The board has been proved in service and has cut the cost of tape a great deal. It was designed for the use of masking tape one inch wide. The board may be changed in size to meet individual requirements.

Procedure

1. Lay out the shape and details in pencil on the lumber.
2. Cut two dadoes ½ in. wide by 1/16 in. deep at *XX*, along the length of the board.
3. Saw 1/16-in. grooves, 3/16 in. deep and ¼ in. on center across the width of the board on a table saw.
4. Drill the ⅜-in. diameter hole at the top of the board.
5. Cut the radii on the corners of the project.
6. Sand to a smooth surface.
7. Apply a wash coat of shellac.
8. Mark with ink or burn in the lines for spacing the tape.
9. Complete the finish.

To load the board with tape, place the left edge of the 1-in. masking tape along the inked or burned in lines, starting from the right side of the board. Thus three pieces of tape will overlap a fourth piece which projects slightly over the edge of

(Continued on page 20A)

STANLEY SHOP TALK

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- Miniature Hope Chest
- Cigarette Dispenser
- Glove Case
- Knicknack Corner Shelves
- Miniature Dough Trough
- Cook Book Shelves
- Telephone Shelf
- Nut Scoop
- Hanging Sewing Cabinet
- Handy Memo Roll
- Spice Cabinet with Shelves

Cranberry Scoop Plant Holder

Cigarette Dispenser

Telephone Shelf

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No. 118

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No. 5-1/4

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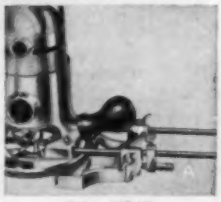
No. 41

New! Two Router Accessories

GA — H268

Stanley Groov-a-matic is the new router guide which fits on the bottom of the router base and allows the user to widen grooves easily after the initial cut without changing the bit or moving the straight edge or batten. Graduations on this cam-shaped guide permit accurate widening by sixty-fourths up to 3/4".

This Stanley Vernier Attachment for your router straight and circular guide No. GA — H249 assures settings of micrometer accuracy. The screw labelled "A" enables you to adjust to the hair-line degree necessary when matching cuts, inlaying, veining, grooving, or in straight line work.



GA — H267

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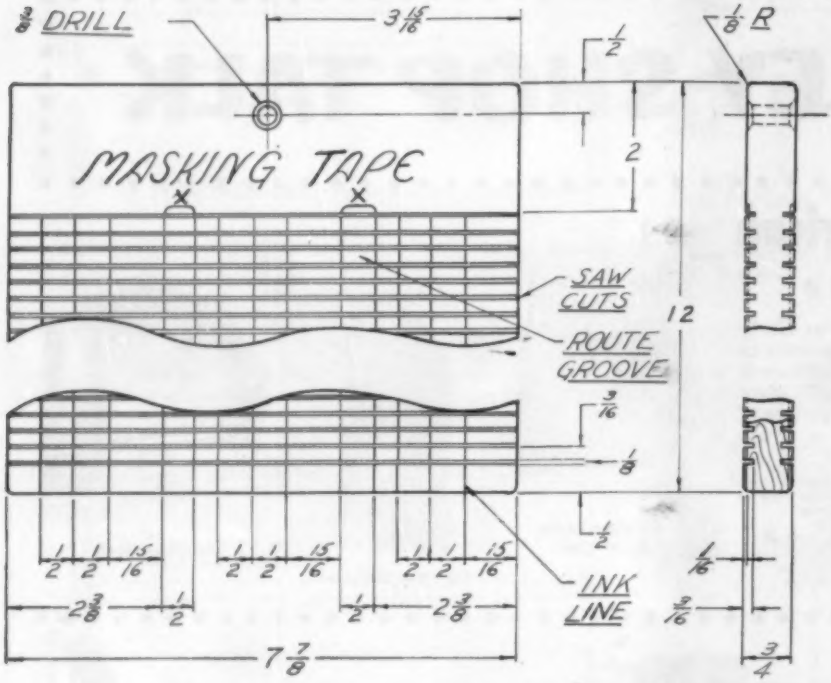

Details of the masking tape board

Left to right: Adding strips of 1-in. wide masking tape to the board, cutting the tape with a sharp knife, and removing a strip of four pices of tape

(Continued from page 5B)

the board. The projection acts as a tab for pulling four small pieces of tape off the board at once. Next, press tightly to the board the three columns of tape. Finally, using the saw cuts as guides, take a sharp knife or razor blade and cut the tape into small pieces. Cut from the left side of the board for best results. Load both sides of the board in the same manner. For best results, hang the board on a wall near the entrance of the room. As the students enter the room each one merely pulls a series of four pieces of tape from the board by using the tab of tape that projects over the edge of the board. When the student gets to his drawing table he can pull the four small pieces of tape apart and apply them to the corners of his drawing.

You will find that the masking tape board will solve many of your discipline and financial problems accompanying the use of tape in the drafting room.

ELECTRICAL TEST BOARDS OR PANELS

1152. Q.: Please advise if you have a record of previous articles on the subject of electrical shop test benches, or test panels. — *B. B.*

A.: We have picked out the articles which we think will give you the information you are seeking. They were all published, as indicated, in past issues of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. The list follows:

Utility Test Board, May, 1928; The Electric Test Board, April, 1931; A Test and Supply Board for the Electrical Shop, October, 1937; Electrical Test and Demonstration Board, October, 1940; Electrical Test Bench, November, 1942; Test Table for Advanced Electrical Work, October, 1944; Electrical Test Board, December, 1945; Electric Answer Board, December, 1946; An Electrical Quiz Board, October, 1950; and Electrical Test Panel, February, 1955. — *J. J. M.*

PERSONAL NEWS

(Continued from page 12A)

JOHN F. ROBOHM RETIRES

John F. Robohm, director of vocational education and consultant in industrial arts for the public schools of Minneapolis, Minn., since 1948, retired recently.

Mr. Robohm was born and raised in Minneapolis, and was graduated from Minneapolis Central High School. He took both undergraduate and graduate work at the University of Minnesota with Dr. Homer J. Smith as his major adviser. He worked in industry in Minneapolis both as a machine and architectural draftsman.

Military service included active duty on the Mexican border in 1916, service in World War I in France with the Rainbow Division, and four years in World War II, being now retired with the rank of Col. of Field Artillery.

Mr. Robohm started teaching mechanical drawing at Central High School, Minneapolis, in May of 1919. In January, 1927, he was transferred to Boys' Vocational School as a teacher of related subjects. In September, 1929, he became counselor-co-ordinator at Boys' Vocational School, and in December, 1930, he became principal of Boys' Vocational School.

Mr. Robohm held this position until the summer of 1948, when he was transferred to the Central Office of the Board of Education as director of vocational education and consultant in industrial arts.

During the thirty-eight years of his career in Minneapolis, many changes in vocational education have taken place, and Mr. Robohm has had an important part in such significant vocational affairs as: the development of the old East High School into the Boys' Vocational School; the upgrading of this school so that it became a Boys' Vocational High School; the planning and building of the new Boys' Vocational High School which is now a part of the Minneapolis Vocational High School and Technical Institute; the joining of the Miller Vocational and Boys' Vocational High Schools into the present school; and the qualifying of the Minneapolis Vocational School as an accredited Area Vocational School. These and many others have seen the work, vision, and planning of Mr. Robohm.

The members of the faculty of the Minneapolis Vocational High School and the industrial-arts instructors of the Minneapolis Public Schools honored Mr. and Mrs. Robohm at a tea and open house in December, and on the same day Mr. and Mrs. Robohm were guests of the Central Office Staff at an evening dinner, at the Park Terrace.

For the next several months Mr. and Mrs. Robohm will travel.

LOUIS M. ROEHL, EDUCATOR, DIES

Louis M. Roehl, for many years an outstanding expert in agricultural education, died at Ithaca, N. Y., on September 16, 1956. He was 75 years old.

Since 1917 Mr. Roehl had been supervisor of farm shop work at Cornell University. Before that he had been director of farm mechanics at the Milwaukee County School of Agriculture; director of the Dunn County Agricultural School, Menomonie, Wis., and teacher in various schools in Wisconsin and Michigan.

(Continued on page 22A)

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PERSONAL NEWS

(Continued from page 20A)

His book, *Farmer's Shop Book*, revised in 1953 by Longhouse, has been used in agricultural courses since 1939. His other books included *Shop Management in Rural High Schools*, and several books on woodworking for the farm.

Mr. Roehl was born in London, Wis., in 1881. He was a pioneer in the introduction of rural shop training in the schools and was widely consulted in setting up and revision of farm shop courses and syllabi.

LEWIS EMERY WASS DIES

Lewis Emery Wass, director of industrial and adult education, Davenport, Iowa, passed away in a Rochester, Minn., hospital, November 19, 1956. He was born on November 24, 1895.

He attended the public schools of Owensboro, Ky., DePauw University, Bradley Polytechnic Institute, Augustana College, the University of Illinois, the University of Iowa, and Iowa State College. He was granted the bachelor of science degree from Bradley Polytechnic Institute, and the master of science degree from Iowa State College.

Mr. Wass served in the National Council of Local Administrators of Vocational Education and Practical Arts — Resolutions, Policy, Membership, Constitution, Legislative, Executive, and Program Committees; also as vice-president and as president for two terms. He served as president of Iowa Vocational Association, as president of Scott County Safety Council, and at the time of his death he was president of the Iowa Council of Local Administrators of Vocational Education and Practical Arts.

Professional experience included: industrial-arts instructor, Amo, Ind., and Davenport, Iowa; supervisor of crafts, Culver Military Academy; director of industrial and adult education, Davenport, Iowa; instructor, industrial education, Bradley extension division. He was appointed by the International Labor Office at Geneva, Switzerland, to write "Training and Functions of Vocational Personnel," for use by the Pan American Union in the twenty South American countries. He was a lecturer, Chamber of Commerce and Trade Associations.

Mr. Wass was a member of the Phi Sigma Chi, Phi Delta Kappa, and Epsilon Pi Tau honorary fraternities. He was a member of the Industrial Education Advisory Committee of Iowa State College. He appeared before the Labor and Education Committee of the U. S. Senate in 1945 in hearings on the George-Barden Act and again in 1954 before the Appropriations Committee of the Senate and of the House of Representatives.

He is survived by his wife, and a daughter.

NEW DIRECTOR

William A. Medesy has been appointed director of the Long Island, N. Y., Agricultural and Technical Institute. Dr. Medesy was formerly dean of New Hampshire University and head of the graduate school.

He is a graduate of Purdue University, received his master's degree in forestry from Yale, and his doctor's degree from Columbia. He has been a national forest administrator and served in World War II in North Africa and Italy.

DR. BOLLINGER RETIRES

Elroy W. Bollinger, professor, industrial education, New York State Education Department, recently retired after a distinguished career of nearly 40 years in industrial education.

Dr. Bollinger received his training at Northern Illinois State Normal School, University of Wisconsin, and Ohio State University. He has taught in the Illinois public schools, the University of North Dakota, where he served as head of the Department of Industrial Arts, and Ohio State University.

In 1936 he became associated with the New York State Education Department as supervisor, and later as professor of industrial teacher training in the New York City center.

Throughout his career, Dr. Bollinger did much teaching, writing, and consulting in vocational and industrial arts school shop planning. He has been author and coauthor of several books and many professional articles. He was responsible for the production of the recent sound filmstrips on education, and contributed to many research and survey projects including a special study of the New York State Vocational and Practical Arts Association.

Dr. Bollinger is also well known for his many and varied hobby activities, particularly in amateur radio, boating, photography, music, and the reproduction of recordings.

Upon his retirement he became associated with a new company which is distributing equipment for servicing aircraft.

COMMISSIONER OF EDUCATION APPOINTED

Lawrence G. Derthick was appointed by President Eisenhower on November 28, 1956, as commissioner of education, Department of Health, Education, and Welfare, Washington, D. C. He succeeds Dr. Samuel M. Brownell who resigned. The appointment is subject to confirmation by the U. S. Senate. Mr. Der-

(Continued on page 24A)

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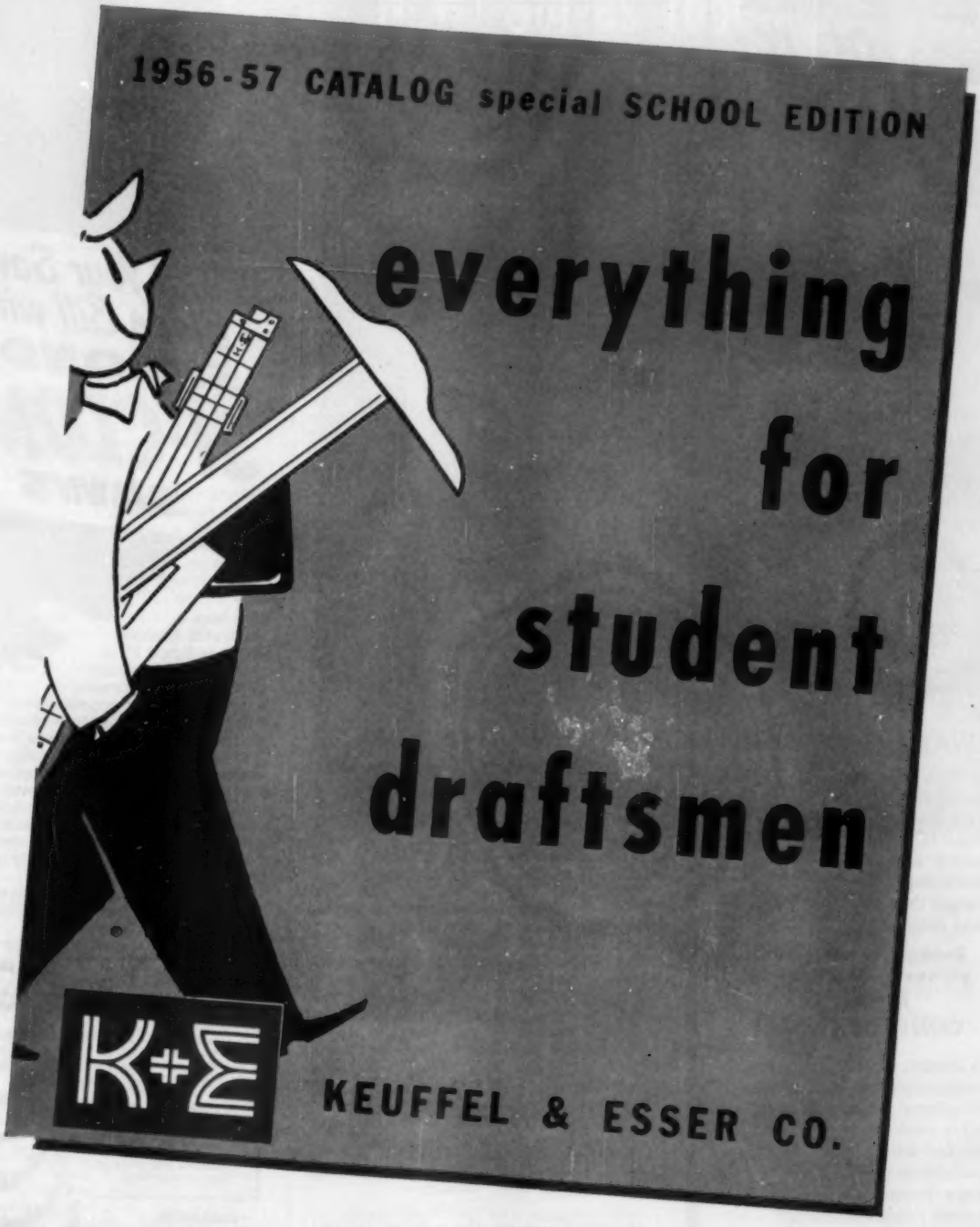

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PERSONAL NEWS

(Continued from page 22A)

thick was sworn in on December 20, 1956. The oath of office was administered by Secretary Marion B. Folsom, in a ceremony at the Department of Health, Education, and Welfare, attended by senior officials of the Department and the Office of Education, members of Congress, and representatives of national organizations.

Mr. Derthick has had a long and distinguished career in education as teacher and administrator and as a member and officer of national educational organizations.

Prior to his appointment as Commissioner of Education, he was superintendent of the Chattanooga, Tenn., public schools since 1942. He served as chief of the Education Branch, Office of Military Government of Bavaria 1948–49, on leave of absence from his Chattanooga position. He was assistant superintendent in charge of instruction of the Nashville public schools from 1935 to 1939.

Mr. Derthick has been active for many years in the American Association of School Administrators and was president of the association for the term 1953–54. He is a member of the Board of Trustees of the Joint Council on Economic Education and of the President's Committee on Employment of the Physically Handicapped. He was a member of the Educational Policies Commission, 1953–54, and is currently serving as adviser to this commission for the term 1955–58.

In addition to his activities in educational organizations, Mr. Derthick is a member of the Committee on School Service of the Boy Scouts of America and of the Advisory Committee on School Relations of the Girl Scouts of the United States.

DR. TERMAN DIES AT 80

Dr. Lewis M. Terman, father of the I.Q. test, died at Palo Alto, Calif., December 21, 1956.

He retired as chairman of the Stanford University psychology department in 1942, but maintained an active interest in psychology until the time of his death.

Since 1922, Dr. Terman had traced the histories of 1500 persons with I.Q.'s of genius. His research set a record for long-time checks on school children.

His studies demonstrated that success is associated more with emotional stability than intellectual brilliance. His gifted subjects were shown to have higher employment records and higher incomes than average.

Dr. Terman was born in Johnson County, Ind., in 1877. He took his A.B. degree at Central Normal College, Danville, Ind., and his first doctorate at Clark University, but since he has been awarded numerous honorary degrees.

He joined the Stanford faculty in 1910, after serving as a professor of psychology at Los Angeles State Normal.

TRADE SCHOOL LEADER IS HIRED

Donald J. Langlie, Uniontown, Pa., was voted in by the Bradford Board of Education, Bradford, Pa., as director of vocational education for the Bradford City School District. The action came at a regular meeting of the board, preceding its annual reorganizational session.

Mr. Langlie assumed his post on January 1, 1957. He has been on the faculty of Union Vocational High School, Uniontown, Pa. The post Mr. Langlie is filling had been vacant for the past year and a half.

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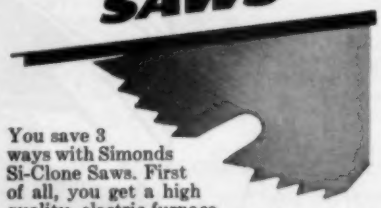

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Easy-Cut	Metal Cutting
Carbide Tipped	– Non-Ferrous
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GUARANTEE
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EARL M. BOWLER ELECTED CHAIRMAN

Earl M. Bowler, assistant director, Trade and Industrial Education Service of the U. S. Office of Education, recently was elected chairman of the national advisory council of Iota Lambda Sigma, national professional fraternity in industrial education.

The organization met in conjunction with the American Vocational Association, which held its fiftieth annual convention at St. Louis, Mo., early in December.

EDUCATOR'S WIDOW DIES

Mrs. John C. Wright, 76, widow of a former director of the Federal Board of Education, died recently after a long illness. Her husband died in April, 1955. He directed the old Federal Board of Education, and later became assistant director of the United States Office of Education.

Mrs. Wright is survived by her daughter, a son, four grandchildren, and a sister. She lived at Chevy Chase, Md.

NEWS ABOUT STAFF MEMBERS

Dr. George Ditlow, formerly of the State Teachers College at Newark, N. J., is now professor of industrial arts at State Teachers College, Millersville, Pa.

Dr. Ditlow's preparation includes graduation from Millersville, a master's degree from the University of Maryland, and a docotor of education degree from New York University.

Hugo Fiora has also become a member of the staff. Mr. Fiora holds a bachelor of science and a bachelor of fine arts degree from Ohio State University, as well as a master of fine arts from the same institution. His special field is ceramics.

For some time he has been a member of the teaching staff of the Abraham Lincoln High School in Philadelphia.

Paul Eshelman of the industrial-arts staff of the State Teachers College, at Millersville, Pa., was represented by a piece of his work at the opening exhibition of the new Museum of Contemporary Handicrafts in New York City.

Mr. and Mrs. Henry Kauffman are spending the semester in a tour of European countries, visiting the British Isles, Denmark, Holland, France, Italy, and Spain.

NEW TEACHER ASSIGNMENTS

Tom Haigwood, formerly instructor at Hawthorne Lane Junior High School, Charlotte, N. C., has joined the staff of the industrial-arts department at Eastern Carolina College.

C. A. Bell, who had been teaching at Charlotte Central School, Charlotte, N. C., is now teaching in the industrial-arts department at Illinois State Normal School.

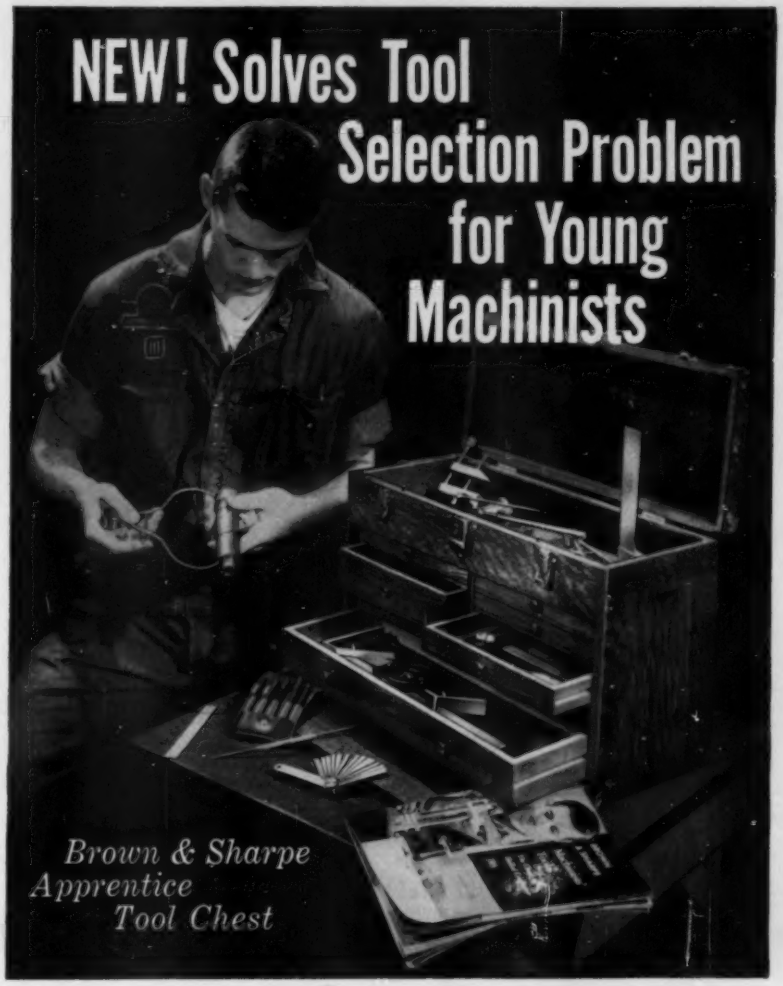
Elizabeth Hunt, now teaching in the industrial-arts department at Oswego State Teachers College, Oswego, N. Y., was formerly a teacher of elementary industrial arts at Charlotte, N. C.

Rex Benson, formerly a teacher at Sedgefield Junior High School, Sedgefield, N. C., is at present acting principal of that school.

♦ Howard R. Schramm, formely an industrial-arts instructor at Shadyside High School, Shadyside, Ohio, has accepted a new position, effective September, 1956, to teach at Maple Heights High School, Maple Heights, Ohio.

♦ William H. Etsweiler, Jr., who was granted his doctor of education degree in January, 1956, from the Pennsylvania State University, is now employed as a guidance counselor in the Senior High School, Butler, Pa.

(Continued on next page)



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PERSONAL NEWS

(Continued from previous page)

DIRECTOR OF PERSONNEL NAMED

William G. Thaler, director of personnel for the American Cancer Society, has been named director of personnel at New York University. His appointment was announced Thursday, December 27, by George F. Baughman, vice-president and treasurer of NYU.

Mr. Thaler will head a newly organized division of the University's business operation concerned with the varied aspects of personnel matters. Within a few weeks members of the division will move into new quarters on the first floor of NYU's recently purchased building at 20–22 Waverly Place.

A 1948 graduate of Hofstra College, Mr. Thaler received the master of arts degree from Columbia University in 1950. He was a consultant for the National Foremen's Institute from 1952 to 1954 and has served as personnel manager for John Wanamaker in Westchester.

Mr. Thaler is a member of the American Management Association, the New York Personnel Management Association, the American Society of Training Directors, and Phi Delta Kappa.

NEW FACULTY MEMBERS NAMED

Dr. Robert G. Hammond has joined the industrial education department at Northwestern State College, Natchitoches, La.

Dr. Hammond spent seven years at Normal University, Normal, Ill. He did his undergraduate work at Normal University, and received the master of art's degree from Colorado State College. He was awarded the Ed.D. from the University of Missouri last January.

Charles H. Wommack joined the department in the capacity of graphic arts instructor. He received his B.S. degree from East Texas State Teachers College, Commerce, Tex. He came to Northwestern from Texas Technological School, Lubbock, Tex., where he was in charge of production printing for the college.

Ronald Gilliland, graduate of Northwestern State College, who has spent two years in service, returned to work on his master's degree. He has been employed as a graduate assistant in the industrial education department.

Oscar Butler, a local architect who was graduated from Auburn University, has been employed as a part-time instructor teaching in the area of drafting.

♦ HAROLD J. MILLER of Santa Barbara College, was awarded the doctorate of education at the June, 1956, commencement exercises at Oregon State College School of Education. For his dissertation the professor made an analysis of the activities of the training departments of 28 industrial corporations. Some of the factors considered included: invested capital per employee, labor costs as a per cent of the sales dollar, and rate of labor turnover.

During the fall semester of 1955, Professor Miller was on leave for research and travel, and at present he is collecting a volume concerning the history and development of corporation schools.

♦ EDWARD MONSON, formerly from Ellendale, N. Dak., will teach metalwork at State Teachers College, Kearney, Neb.

♦ MAYNARD ENVICK, formerly from the High School, Kearney, Neb., will teach crafts at State Teachers College, Kearney.

♦ DR. VERNE C. FRYKLUND, president, Stout State College, Menomonie, Wis., and Mrs. Fryklund, traveled in Denmark, Norway, Sweden, Finland, France, and England during June and July, 1956. They visited technical universities in all those countries, with Dr. Fryklund having the opportunity to confer with leading educators. He gave special attention to the Royal Vocational Education Program of Sweden.

♦ Two men are attending the Oregon State College this year in order to take a knowledge of their program of industrial education back to foreign lands.

CASIMIRO E. MANINGAS is superintendent of industrial arts in the national bureau of public schools in the Philippine Islands. He is doing graduate work and combining studies of industrial arts education with trade and industrial education.

SHANKER L. RAJBANSHI is from the nation of Nepal. He is to be engaged in teacher training in the new national university.

♦ DR. WILLIAM A. SELLON has joined the faculty of the State Teachers College, Bemidji, Minn. During the past summer Dr. Sellon was guest professor of Industrial Education at West Virginia University, Morgantown, W. Va.

Previously Dr. Sellon was on the faculty at Ohio University, Athens, Ohio.

♦ CHRIS H. GRONEMAN, head of the Department of Industrial Education and Coordinator for teacher education at the Agricultural and Mechanical College of Texas, served as guest professor at the New Brunswick Technical Institute in Moncton, New Brunswick, Canada, during the 1956 summer session.

♦ EDWIN D. STEELMAN, who for the past four years was instructor of drafting at Langford Junior High School, Augusta, Ga.,

(Continued on page 28A)

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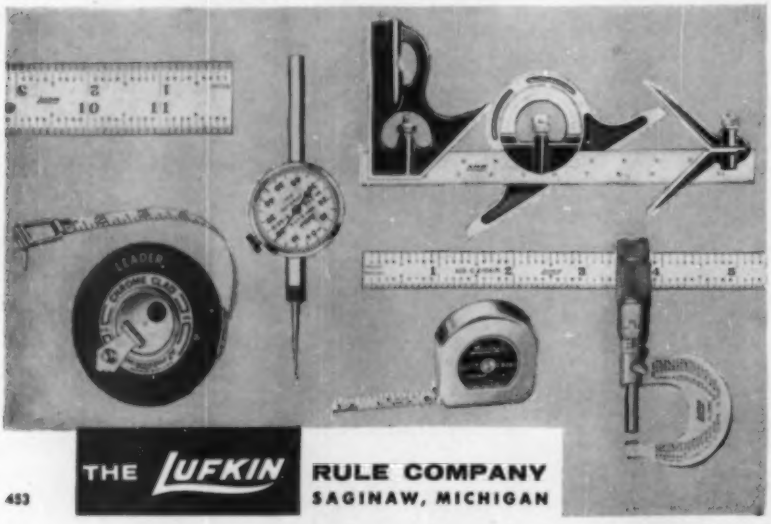

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#49 STUDENT STUDY GUIDE for Metalwork Technology and Practice

By O. A. Ludwig

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#2 MACHINE WOODWORKING

By Robert E. Smith

Detailed instruction for operation and care of lathes, grinders, saws, jointers, planers, shapers, routers, mortising machines and sanders. Two hundred twenty-four graphic illustrations show how to proceed. Safety procedures stressed. 152 pages, $3.00

#75 GENERAL LEATHERCRAFT

Revised 1955

By Raymond Cherry.

Carving panels by Ken Griffin

Completely rewritten book with 365 new illustrations. A comprehensive manual for the beginner who wants to work with leather — for fun or profit. Includes 31 attractive projects with step-by-step instructions for making billfolds, purses, bookends, belts and the like. Numerous photographs and drawings.

144 pages, $1.50

#15 GENERAL DRAFTING

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Beginner's text presenting the fundamentals of drafting in 2 parts: (1) operations (manipulative), (2) information topics (things to be known). Problems presented with each unit. 430 illustrations. $1.50

#55 TEACHING SUCCESSFULLY the Industrial Arts and Vocational Subjects

By G. Harold Silvius and Estell H. Curry

Analyzes the methods used by successful teachers in carrying on 35 basic teaching activities in laboratory-type subjects. Discussions and suggestions regarding class organization, planning work, methods and technique, safety, selection and use of teaching materials, student evaluation and community relations.

339 pages, $4.50

#1 GENERAL SHOP BENCH WOODWORKING

Revised 1955

By Fryklund and LaBerge. Covers the basic fundamentals of hand woodworking. Step-by-step instruction; 387 illustrations.

Cloth, $3.00; Paper, $1.50

#30 GENERAL SHOP METALWORK

By Dragoo & Reed. Basic beginner's text covers bench, sheet and art metal, ornamental metalwork. $1.40

#36 GAS AND A.C. ARC WELDING & CUTTING

By R. E. Jennings (Revised August, 1956). General text for beginners. Stresses common practices and safety procedures. 92 pages, $1.50

#37 FORGING AND WELDING

By Robert E. Smith (Revised Jan. 1956). Forging equipment, methods and operations; welding equipment and procedures. Illustrated. $3.60

#80 ACTIVITIES IN CERAMICS (NEW)

By Seeley-Thompson (Publication date June 1956). Beginning detailed instruction and activities in a wide range of types of activity with clay. 145 illustrations. 84 pages, $1.50

#56 TEACHING MULTIPLE ACTIVITIES in Industrial Education (NEW)

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By Otto A. Steinike (Revised August 1956). Teaches blueprint reading without teaching drawing.

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- #60 GRAPHIC ARCHITECTURAL DRAFTING — *By J. Edgar Ray.* 194 pages. $4.80
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PERSONAL NEWS

(Continued from page 26A)

has resigned that position to become the Vocational School Director at the Georgia Training School for Boys, Milledgeville, Ga.

♦ FRANK DOHANICH, head of the industrial-arts department at the West Frankfort High School, is teaching part time at the Southern Illinois University. Mr. Dohanich is a graduate of Southern, and was previously head of industrial arts at the high school, Du Quoin, Ill.

♦ HAROLD L. CAR, a Southern Illinois University graduate in 1956, has accepted a lectureship in industrial education, which became effective in September, 1956. Prior to this time, Car had been a graduate assistant. His experience includes service parts manager in the automotive industry. His education has been aimed toward the teaching of industrial arts.

News Notes

AUDITORIUM DEDICATED

Elizabeth M. Fish, for many years principal of the Miller Vocational High School, Minneapolis, Minn., was honored on December 16, 1956, when the new auditorium at the Minneapolis Vocational High School and Technical Institute, was formally dedicated and named the Elizabeth M. Fish Memorial Auditorium.

Miss Fish started the girls' vocational education in Minneapolis way back in 1914, and was principal up till the time of her death in 1939.

The program for the dedication was held at 2:30 p.m., in the auditorium, at which time Dr. Rufus A. Putnam, superintendent of schools, gave the principal address.

The memorial to Miss Fish was given by Miss Agnes R. Crounse, former principal of the Miller Vocational High School.

Frank E. Adams, president of the Board of Education, presented the auditorium to Raymond Nord, present principal of the Minneapolis Vocational School, who gave a short speech of acceptance.

Among the speakers on this occasion was Dr. Dean Schweickhard, state commissioner of education, St. Paul, Minn.

ENGINEERING GRAPHICS TEACHERS WILL MEET

Engineering graphics teachers from colleges throughout the nation will meet at the Rice Institute, Houston, Tex., from January 30 through February 2, 1957.

The annual midwinter meeting of the Engineering Drawing Division of the American Society for Engineering Education will include eight technical papers and two technical inspection trips. The role of graphical methods in modern engineering procedures will be emphasized.

Following a report on the use of exploration information in oilfield development by J. S. Blanton of the Scurlock Oil Company on January 31, ASEE members will visit the Pierce Junction Oil Field to inspect drilling operations and field production problems. A field trip to the Galveston area is planned for Saturday, February 2.

At a banquet on Friday evening in the Rice Institute Commons, Dr. Carey Croneis, Provost of Rice, and head of the Institute's Geology Department, will speak on "South America in Color."

Other speakers at technical sessions will include Professor Steven A. Coons of the Massachusetts Institute of Technology, Professor S. B. Elrod of Purdue University, Dr. L. D. Haskew of the University of Texas, Professor J. R. Holmes of the University of Texas, Dr. W. M. Ruse of the Humble Oil and Refining Company, Professor J. R. Sims of Rice Institute, and Professor C. H. Springer of the University of Illinois.

The Houston chairman for local arrangements is Professor A. P. McDonald, head of the department of engineering drawing at Rice. Registrations will be at the Shamrock Hotel, and all sessions will be at the Rice Institute campus.

CERAMIC LEAGUE, INC., ANNOUNCES CONTEST

Ceramic Leagues Inc., of Newark, N. J., a nonprofit making organization for the advancement of ceramics as a hobby, announce the Fifth Ceramic contest.

The entries will be exhibited and judged, during the "5th Eastern Ceramic Hobby Show," to be held in Convention Hall, Asbury Park, N. J., May 4–9.

As interest in this annual contest mounts additional prizes are added. Last year, together with ribbons and trophies $1,300 in cash prizes were awarded.

It is suggested that those wishing to compete, start work at once upon the ceramic pieces they will enter.

The committee to whom application for entry is to be made, will be announced shortly.

The contest, as usual, will have the special division for children's entries.

(Continued on page 30A)

38 live ideas for the metal and general shop instructor
BRAND NEW!
Contemporary Sheet Metal Projects for beginning metal workers
Six spanking new projects that teach sheet and perforated metal on the Bender, Roller and Brake.
UP-TO-DATE!
Suggestions in Wrought Iron for the Modern Home
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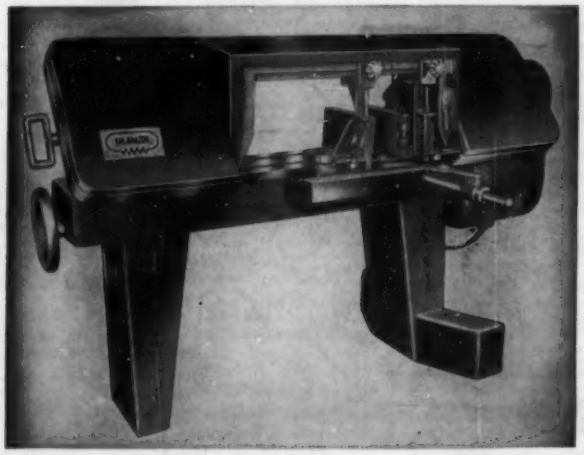

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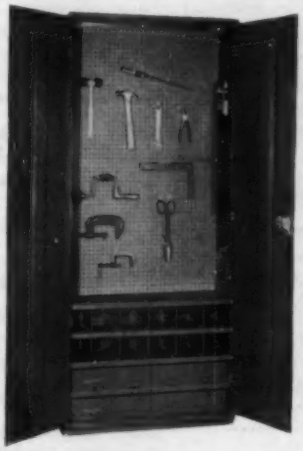

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NEWS NOTES

(Continued from page 28A)

WORKSHOP AT COLLEGE

Instructors engaged in demonstrating basket weaving techniques and skills at the Industrial-Arts Workshop at Oregon State College, Corvallis, Ore., are shown. From the left:

Workshop at Oregon State College, Corvallis

S. L. Rajbanshi, instructor from the National Teachers Training Center, Nepal, who has been deputed here for one year for taking Industrial Education; Mr. Johnson, instructor of recreational handicrafts; Professor Cox, head of the Industrial Arts and Engineering Department; and John Simmons, a graduate student of Industrial Education.

NEW FILM RELEASED

The following film has been released by Stout State College, Menomonie, Wis., and is now available for showing: Industrial Education in Your Future, 21 min., sound, color.

This film shows how high school students' interest in industrial vocations may be directed toward a college career in industrial education or industrial technology. It depicts technical, academic, and recreational facilities for such a training program available at Stout State College. Sent free upon request.

Requests should be sent to *Dr. John A. Jarvis, dean, division of industrial education, Stout State College, Menomonie, Wis.*

New Publications

General Shop

By Chris H. Groneman and John L. Feirer. Cloth, 342 pp., 6⅝ by 9½ in., illus., $3.88. McGraw-Hill Book Co., Inc., New York, N. Y.

This is the second edition of this book. It is the product of two high standing, experienced, educators in the field of industrial-arts education.

The authors based their book upon requests obtained from 538 teachers of industrial-arts general shops. In this second edition a section on ceramics has been added.

The nine sections of the book introduce the student to drawing and planning, woodworking, metalworking, electricity, plastics, leathercraft, home maintenance, and ceramics. A number of projects in each of these subjects are presented in the book.

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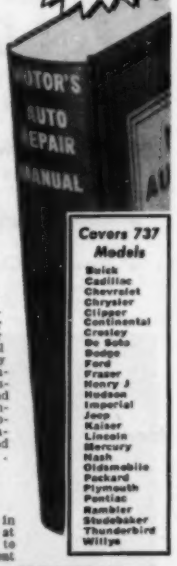

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Healthy Days

By Wilcox, McCall, Brouillette, and Bolton. Cloth, 320 pp., 6⅛ by 8½ in., illus. Beckley-Cardy Co., Chicago, Ill.

This book contains 20 units which show how the young can develop healthy attitudes, eat proper foods, keep the body healthy, exercise and grow strong, get along with others, practice safety, and help their community to be a healthy place to live.

Growing Field Crops

By George H. Dungan and W. A. Ross. Cloth, 495 pp., 6¼ by 9¼ in., illus., $4.96. McGraw-Hill Book Co., Inc., New York, N. Y.

This is a comprehensive book on how to grow the proper kinds of crops for a given locality. It describes how to choose the crops to grow, how to select varieties of crops, how to check and treat seed for planting, and how to prepare, plant, and set small plants.

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Then comes harvesting, storing, and marketing the crops, and the keeping and using of field-crop records.

Descriptive Geometry

By Steve M. Slaby. Paper cover, 353 pp., 5¼ by 8¼ in., illus., $2.25. Barnes & Noble, Inc., New York, N. Y.

This is a very practical exposition of this subject which for years was taught in but a theoretical manner to the detriment of thorough understanding by many students.

The ten chapters describe the concept of descriptive geometry, lines, planes, lines and planes, mining problems, revolution, vectors, solids and surfaces, intersection of surfaces, development of surfaces.

The appendix presents the analytical method, perspective drawing, simple shades and shadows, and miscellaneous engineering applications.

Woodworking Projects and Planning Guide

By K. T. Olsen. Cloth, 63 pp., 6⁹⁄₁₆ by 9⁷⁄₁₆ in., illus., $1.50. The Bruce Publishing Co., Milwaukee 1, Wis.

This interesting and helpful little book covers approximately 200 projects which appeal to teen-age boys and girls who are interested in one or more of the hobbies listed here: treasure collectors' arts and crafts, electricity, engineering, dramatics (puppet show), games, home improvement, home workshop, mechanics, model making, music, personal belongings, pets, birds, photography, puzzles, shelter, religious articles, sports, travel, toys, and scientific projects.

The suggestions contained in the book will help the student choose a project which he will care to make and will help him in understanding a little better what designing a project means.

Extraclass Activities in Aviation, Photography, and Radio for Secondary School Pupils

By Willis C. Brown. Office of Education Bulletin 1956, No. 11, 48 pp., 25 cents. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

How can schools help meet pupil needs in the three areas of aviation, photography, and radio which are especially important to modern industrial and technical life?

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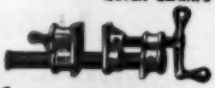

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NEW PUBLICATIONS

(Continued from page 31A)

This bulletin deals with three selected extra-class activities important to the nation's scientific and technological progress and with their place in the modern secondary school. It reviews and highlights good practices in these three fields so that schools now having programs may be able to improve them and those having none may be stimulated to start them.

A great many secondary schools are today carrying on club activities of the kind described in this bulletin, but many more could well consider doing so as a means to help identify pupils having special interests and aptitudes. Further, these schools might well discover that the same activities could motivate formal classroom interest and achievement in science, mathematics, and industrial arts.

Engineering Inspection, Measurement and Testing

By H. C. Town and R. Colebourne, Cloth, 191 pp., 6 by 9 in., illus., $8.75. Philosophical Library, New York, N. Y.

This book should be a great help to all who are learning about, or engaged in actual precision measurement and inspection.

It describes the function of the inspection department, standardization, principles of precision measurement, standard of length, linear measurement, comparators and measuring machines, multi-dimension inspection machines, automatic sizing during the performance of machine operations, workshop inspection methods and calculations, angular measurement, testing, straightness and flatness, screw-thread measurement, and surface-finish measurement.

Picture Book of TV Troubles (Vol. 6) — Horizontal and Vertical Sync Circuits

By John F. Rider Laboratories Staff. Paper, 120 pp., 5½ by 8½ in., illus., $1.80. John F. Rider Publisher, Inc., New York, N. Y.

This is Volume 6 of a series of eventually 8 titles devoted to the presentation of troubles in television receivers in picture form. It deals with two sections of the receiver which are prone to trouble and which can conceivably confuse the technician. The book is practical throughout as the authors performed the necessary tests to establish the facts presented. The information should prove valuable to all TV service technicians and even to those who are studying the art, because the authors correlate the trouble with the component at fault, and simplify greatly the diagnosis by photographically illustrating the effect of the troubles as seen on the picture tube screen, and by the incorrect signal waveform as would be noted on a test scope applied to the circuit. The book deals with all types of horizontal and vertical sync systems.

Superheterodyne Converters & I.F. Amplifiers

By Alexander Schure. Paper, 56 pp., 5½ by 8½ in., illus., 90 cents. John F. Rider Publisher, Inc., New York, N. Y.

This book is Volume 12 in the Rider Electronic Technology Series. It provides a clear explanation of the theory underlying the operation of mixers and converters, and the theory of the I.F. amplifier. The various facets of performance and design relating to these

(Continued on page 34A)

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NEW PUBLICATIONS

(Continued from page 32A)

portions of the superheterodyne receivers are presented in a clear style, making both the function and design factors clearly understandable. Mathematics is not used, nevertheless the explanations are excellent. This book is suitable for all who are studying the operating principles of superheterodyne receivers, and for those who have occasion to maintain these receivers.

Introduction to Color TV

By M. Kaufman and H. Thomas. Paper, 160 pp., 5½ by 8½ in., illus., $2.70. John F. Rider Publisher, Inc., New York, N. Y.

This is the second edition of this book the aim of which is to present to the student and technician the fundamentals of the system of color television which is approved at present.

The six chapters present the fundamentals of color television, the NTSC color television system, tricolor picture tubes, the color television receiver, adjustment of color television receivers. The book also contains a useful glossary.

Induction Heating Practice

By D. Warburton-Brown. Cloth, 191 pp., 6 by 9 in., illus., $10. Philosophical Library, New York, N. Y.

This book on high-frequency induction heating clearly describes methods of practical applications in industrial problems.

Its chapters present a brief survey of practical aspects, work coils and inductors, soldering by induction methods, induction brazing, induction methods of hardening, gear hardening, miscellaneous applications, component design for induction heating, and locating jigs and handling fixtures.

Applied Automation

Edited by James R. Custer. Cloth, 236 pp., 8¾ by 11¼ in., illus., $6. Chilton Company, Publishers, Philadelphia, Pa.

A compilation of significant articles showing the application of modern automation techniques as applied during the past four years in the automotive industry in the line of painting, inspection, testing, assembling, machining, stamping, welding, forging, heat treating, and plating.

It describes the evolutionary progress issued in by the introduction of the transfer machine, and also depicts many typical automatic applications, and shows the employee growth in industry since automation was introduced.

Seamanship

By T. F. Wickham. Cloth, 192 pp., $3.75. Philosophical Library, New York, N. Y.

While the author of this book is an Englishman and many details of the work are written from the standpoint of British usage, the book has universal appeal and should be found especially helpful in vocational schools where workers for the Merchant Marine are being trained. Seamanship has an international character and ships of every nationality follow the same general laws and procedures. The amateur yachtsman will find the book full of interesting and useful information.

Radio-Television and Basic Electronics

By R. L. Oldfield. Cloth, 342 pp., 5¾ by 8½ in., illus., $4.95. American Technical Society, Chicago, Ill.

This book has been written as a general introduction of today's diversified electronics in-

(Continued on page 36A)

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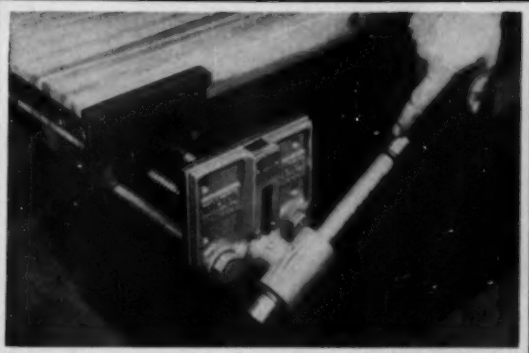

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NEW PUBLICATIONS

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The book also contains a glossary of electronic terms and an appendix containing electronics formulas, abbreviations and letter symbols, and graphic symbols.

Getting Started With Power Tools

Cloth, 160 pp., 6⅝ by 9¼ in., illus., $2.50. Popular Mechanics Press, Chicago, Ill.

This book is a veritable godsend to the home worker who has not had previous training in using power tools. Every operation is well explained, and all directions are accompanied by clear line or photographic illustrations.

In the eleven chapters contained in the book, the selection and installation of power tools is explained. Then the operation of the circular saw, dado-head techniques, drill-press operations, the operation of the band saw, and the use of the jig saw, working with the wood lathe, the wood-shaper techniques and the fundamentals of the jointer, are clearly and understandably expounded.

Pictorial Microwave Dictionary

By Victor J. Young and Meredith W. Jones. Paper, 116 pp., 5½ by 8½ in., illus., $2.95. John F. Rider Publisher, Inc., New York, N. Y.

With the ever increasing application of microwaves, there has developed a need for a ready reference which defines and explains present-day microwave terminology. This pictorial dictionary, written by two acknowledged experts in the microwave field, presents microwave language with rigorous accuracy. Derivation, explanation, definition, and illustration are combined in such fashion as to give the reader complete coverage of microwave activity. The organization of the dictionary makes it easy to use, and very understandable. Useful to engineers, laboratory technicians, engineering students, and others who have a strong interest in microwave techniques.

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Business and Personal News

NEW REGIONAL SERVICE MANAGERS

The Black & Decker Manufacturing Company, Towson, Md., have announced the appointment of Rovan A. Wernsdorfer as Northeastern Regional Service Manager. The post was created recently as a result of the portable electric tool company's divisionalization when its nationwide chain of product service branches was formed into a separate division apart from its sales force.

Mr. Wernsdorfer entered the Black & Decker organization in 1936 as a service repairman, later advancing to service manager in charge at different times of service branches at Towson, Atlanta, and Baltimore. More recently, prior to his present appointment he was branch service supervisor in charge of service operations all over the United States.

As Regional Service Manager, Mr. Wernsdorfer will supervise the northeastern portion of the facilities which Black & Decker maintains over the United States and Canada for efficient portable electric tool repair service to its customers. This region includes Maine, Vermont, New Hampshire, Connecticut, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, Maryland (eastern shore), and Delaware. He will report to John P. Spain, sales manager of Black & Decker's Product Service Division.

Robert A. Brown has been appointed Central Regional Service Manager. He entered the Black & Decker organization in 1936 as a service repairman. Later he became service manager of the Indianapolis branch, and then of the Cincinnati branch. Until the time of his present appointment he was a sales representative for the company in the middle and eastern Tennessee region.

As Regional Service Manager, Mr. Brown will supervise the Central portion of the facilities which Black & Decker maintains over the United States and Canada for

efficient portable electric tool repair service to its customers. This region includes Ohio, Michigan, portions of Wisconsin, Indiana, Illinois, Kentucky, and West Virginia. He will report to John P. Spain, sales manager.

Elmer G. Shue has been appointed Southeastern Regional Service Manager of The Black & Decker Manufacturing Company. He entered the service of this organization in 1943 as a service repairman. Later he became a sales representative for the company in the Virginia-West Virginia region.

As Regional Service Manager Mr. Shue will supervise the Southeastern portion of the facilities which Black and Decker maintains over the United States and Canada for efficient portable electric tool repair service to its customers. This region includes Virginia, Maryland, the Carolinas, Georgia, Florida, Tennessee, Alabama, Arkansas, Louisiana, and Mississippi. Mr. Shue will report to John P. Spain, sales manager.

REVONAH PURCHASES MUMMERT-DIXON COMPANY

James F. Malcolm, president, Revonah Spinning Mills, announced that Revonah has acquired the entire stock of the Mummert-Dixon Company of Hanover, Pa., and will operate the company as a subsidiary.

The Mummert-Dixon Company manufactures wire cloth machinery, grinders, facing and boring heads, and special machinery; they also run a complete individual shop for building all types of wood patterns.

Charles A McGough, Jr., Will Be President

Management will be under the supervision of Charles A. McGough, Jr., who will be president of the company. He has been associated with the Electric Service Manufacturing Company of Philadelphia for a number of years. He came to Hanover as manager of their tool manufacturing plant which had operated in Hanover as the Peerless Equipment Company. During the past several years he has been manager of the Company's tool division in charge of sales with general supervision over engineering, advertising, and production. He is an electrical engineer and professional engineering graduate of Villanova College and Heidelberg University, Germany. At the present time he serves as a consulting engineer to the American Association of Railroads.

Samuel B. Fortenbaugh, Jr., as Secretary-Treasurer

Samuel B. Fortenbaugh, Jr., secretary-treasurer of Revonah and Wall Rope Works of New York City, will also hold this position in the Mummert-Dixon Company.

The directors will be as follows: Charles A. McGough, Jr., Samuel B. Fortenbaugh, Jr., James F. Malcolm, H. M. Wall, and Luke W. Rohrbaugh.

The Mummert-Dixon Company was founded as a pattern shop by Ervin S. Mummert, who later became associated with Joseph O. Dixon in the designing and manufacturing of the present products of the company. The company was incorporated in 1907. Operations will continue under the same name with all present personnel.

Revonah was organized in Hanover in 1926 for the manufacture of Jute Carpet Yarns. The company is now known world wide and has a leading place in the industry.

The present officers of Revonah are as follows: James F. Malcolm, president and general manager; Robert F. Fitzpatrick, vice-president and sales manager; Samuel B. Fortenbaugh, Jr., secretary-treasurer; and H. M. Wall, R. M. Shafer, Sr., and V. D. Shafer, directors.

Descriptive Material

HAMILTON CATALOGS 218 AND 219

Hamilton Manufacturing Company have made available their two new catalogs, Nos. 218 and 219.

Catalog No. 218 illustrates Hamilton's new line of laboratory furniture for high schools and colleges.

The 219 catalog illustrates the completely new Hamilton product in the form of a complete line of arts and crafts furniture and equipment. In the design of this equipment they have attempted to combine color, the latest developments in materials, and new construction practices into a completely functional line of arts and crafts equipment which would be both attractive and practical.

For your copy write to the manufacturer.

(For Convenience Circle Index Code 0212)

BOICE-CRANE CATALOG NO. 57

A new catalog of power tools for the cutting, shaping, drilling, and finishing of wood, metal, and plastics has just been produced by Boice-Crane Company.

Several new tools are described therein for the first time. Included in this catalog No. 57 are details, specifications, and illustrations of band saws, contour saws, band filers, cutters, shapers, drill presses, tool and

(Continued on next page)

CASTOGLAS PROJECT OF THE MONTH

These action photos are typical of the clear-cut instructions in the Marine edition of THE CASTOLITER, "How to Make Old Boats New" and "How to Build All-Fiberglass Boats."

Build Your Own

FIBERGLASS BOAT

Or leakproof your old or new wood boat with Castoglas-impregnated fiberglass. Eliminate, once and for all, that annual chore of caulking, painting and refinishing. A fiberglass protected hull won't swell in the water nor dry and shrink out of water. It is ready to go the minute you are ready to use it . . . every time.

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This 8th grade boy built his own fiberglass boat for less than $40.00. It weighs only 12 lbs., yet it is stronger than any wood boat weighing several times as much. It took two boys only one day to complete, from start to finish. Nothing like it has ever been done before and the simplicity of it is downright uncanny.

If you and your students — and the many boat-builders in adult evening classes — are interested in these practical and profitable projects, we'll be glad to tell you all about it. Write to

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DESCRIPTIVE MATERIAL

(Continued from previous page)

knife grinders, jig saws, jointers, lathes, planers, belt and spindle sanders, saw jointers, shapers, and spinning tools.

A free copy available upon request.

(For Convenience Circle Index Code 0213)

1957 PLYWOOD CATALOG

The Douglas Fir Plywood Association announces a new 12-page two-part illustrated catalog for 1957 that covers fir plywood grades, speciality products and application data in condensed tabular form for architects, builders, engineers, dealers, and building code officials.

Information in the catalog covers essential data needed in the construction field. The catalog is designed for maximum simplicity of use and quick-reference without sacrificing essential information.

Sample copies will be supplied without charge from Douglas Fir Plywood Association.

(For Convenience Circle Index Code 0214)

THE NEW APPROACH TO PAINT BRUSH CLEANING

This is the subject of a brochure prepared by Wisconsin Laboratories, Inc. It covers the matter of cleaning and storing of paint brushes, improvements and new developments in paints, and important improvements in the construction of paint brushes.

Some interesting topics are: the old procedure; the new method; vapor action is scientific; why do paint brushes get hard?; how vapor action works; rapid action; reclaiming hard brushes; how to change color; and making a brush washing bath.

These and other points of interest to the reader will be available to anyone by asking for a free copy of "New Approach to Paint Brush Cleaning."

(For Convenience Circle Index Code 0215)

BETTER LIGHT BETTER SIGHT NEWS

Better Light Better Sight Bureau, organized under the sponsorship of the electric industry to foster through educational means a better understanding of the relationship of light and sight, are the publishers of a bimonthly magazine called Better Light Better Sight News. They also publish teaching aids about light and sight for use in the classroom, consumer folders on home lighting, and films.

The magazine is available by subscription, or separate issues may be procured in quantities until supply is exhausted.

Further information may be obtained by requesting it from Better Light Better Sight Bureau.

(For Convenience Circle Index Code 0216)

LUMBER COMPANY PRICE LIST

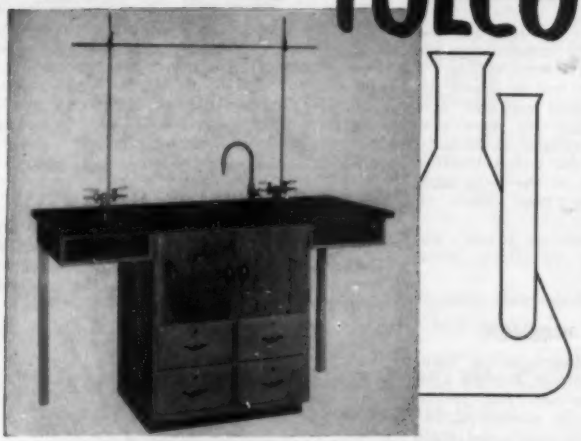
The Bedford Lumber Company have released their lastest price list covering beautiful chests and other items of furniture made of solid Tennessee aromatic kiln-dried red cedar. This chest stock is made in Tennessee. All panels are glued up, sanded to ¾-in. stock, and cut ready to assemble. Hardware is furnished with each chest and consists of combination hinges, lid checks, lock, glides for feet, and all screws.

Other items of furniture include all hardware, which consists of lock, screws, magnetic catches, matching black brass-trimmed hinges, and door pulls. Also metal leg hangers are furnished for all round legs.

For your copy of this price list write to the Bedford Lumber Company.

(For Convenience Circle Index Code 0217)

Now - LABORATORY FURNITURE by TOLCO



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Shop Equipment News

KING-SIZE VISUAL AID

A Stanley jack plane of "Paul Bunyan" proportions was made by Charles W. Wright, woodshop instructor, and students of Sturges Junior High School, San Bernardino, Calif., as a teaching aid. The plane is made entirely of wood, except for the adjusting knob screw which is a discarded wood vise screw. A faithful reproduction of the Stanley 11½-in. junior jack plane, shown on the right, the wood model is scaled at 3 inches equal 1 inch.

King-Size Visual Aid

Because of its out-sized proportions, the model plane makes a lasting impression on students. Names and functions of the various plane parts and their relation to each other are more easily remembered. As a result, students handle the real jack plane with authority and skill.

For further information write to The Stanley Works.

(For Convenience Circle Index Code 0201)

DURO COMBINATION POWER TOOL UNIT

Duro Metal Products Company have developed a new combination power tool unit, which is a practical interpretation of functional tools for today's expanding cost-conscious market. This new precision unit combines a 10-in. floor model tilting arbor saw with a 5-in. jointer, and both are operated from a single 1 h.p. motor. The jointer is conveniently positioned to the left of the saw table and when not in use functions as a table extension. A mere flip of the V-belt from one pulley to another (safely positioned behind the saw) puts either unit into immediate operation, automatically immobilizing the other as a fool-proof safety precaution.

Duro Combination Power Tool Unit

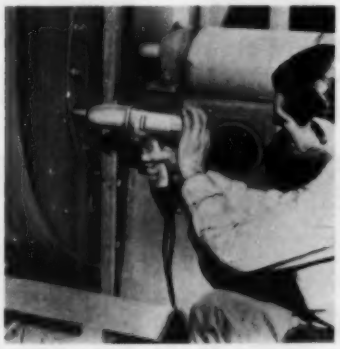
The 10-in. tilting arbor saw is driven by two V-belts and is equipped with the new style Dual Lock pistol grip rip fence that rides on front and rear tubular guide bars. Cast iron extensions can be bolted together and attached to the right of the main table offering 27¼-in. distance from blade to fence.

For complete specifications, prices, and additional details, write to Duro Metal Products Company.

(For Convenience Circle Index Code 0202)

NEW IMPACT WRENCH

The Black & Decker Manufacturing Company announces a new Impact Wrench constructed with such ruggedness that service problems on it are practically eliminated. Designed for cool-running, durability and speed while delivering an enormous steady output of power, the new Impact Wrench will provide assemblymen and mechanics with the perfect tool for nut running, as well as for driving cap and lag screws.



Black & Decker Impact Wrench

The Impact Wrench which weighs 7 lb., and delivers 1800 high-intensity impacts per minute, cannot be stalled or overloaded. Driven by a special Black & Decker-built motor, its power output is identical for operation either in forward or reverse. A specially designed centrifugal fan and ventilating system give this tool the coolest possible operating temperature at all times.

In addition to power and durability, the Impact Wrench reaches its maximum torque in six seconds. This extra speed saves hours every day in assembly, disassembly, and repair work, and increases shop output by making possible more work per operating hour.

Write to the manufacturer for more information on other unique features of this new wrench.

(For Convenience Circle Index Code 0203)

MAESTRO INTERIOR CUSTOM STAINS

Pittsburgh Plate Glass Company have announced the development of 24 different colors of wood stains to provide a complete color range for light woods currently favored for new home interiors.

The new wood coating, to be known as Maestro Interior Custom Stains, includes colors in all popular wood shades plus new modern tints in reds, blues, and greens.

Maestro tube colorants are employed to provide the new finishes. These are added to Waterspar Extra Pale Clear Varnish at the rate of two ounces to the gallon. The colorants are packaged in four-ounce, one-ounce, and quarter-ounce tubes.

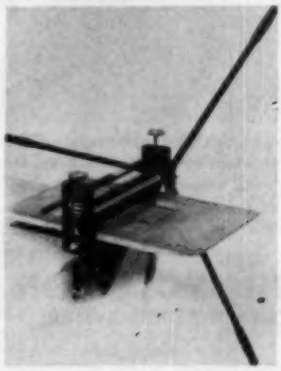
Waterspar Extra Pale Clear Varnish is an alkyd finish particularly advantageous where a minimum of discoloring is desirable. For wood coverage it offers transparent protection without discoloring delicate wood stains.

Maestro Interior Custom Stains are available from Pittsburgh Plate Glass Company branches, and from dealers.

(For Convenience Circle Index Code 0204)

LASZLO UNIVERSAL HAND PRESS

Rembrandt Graphic Arts Company are offering new added features to the Laszlo Universal Hand Press, which will add to the popularity of this machine in the printing shop as well as the art class.



Laszlo Universal Hand Press with Added Features

This hand press has two interchangeable beds which make it possible to print every medium of the graphic arts. A highly appreciated feature of this press is the simplified method of printing colors in perfect register.

The new items are: (1) the simple method of printing celluloid etchings in color; (2) square edged 1-in. thick lithographic stones are offered by the manufacturers in 9 by 12-in., and 12 by 14-in. sizes, which fit into the chase of the press and make printing of color lithographs as simple as the well-known method of printing color wood blocks.

Detailed step-by-step instruction booklets are furnished free with the press.

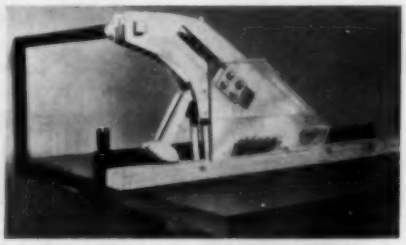
A catalog and supply list are available by writing to the manufacturers.

(For Convenience Circle Index Code 0205)

CIRCULAR SAW SAFETY GUARD

General Scientific Equipment Company have made available a revolutionary new gliding-action guard for use on any table model circular saw, which lets the user see all work

(Continued on page 42A)



Circular Saw Safety Guard

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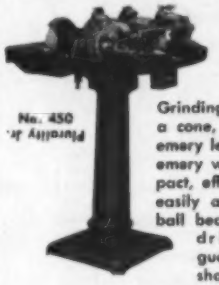

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Grinding can be done on a cone, coarse or fine or emery leather stropping or emery wheels. Unit is compact, efficient, serviceable, easily accessible and has ball bearing direct motor drive. Especially guarded for school shop use. Details on request.

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HANOVER, PENNSYLVANIA
Originators and Pioneer Manufacturers of Oilstone Tool Grinders

SHOP EQUIPMENT NEWS

(Continued from page 40A)

operations clearly through transparent plastic shields.

Providing many safety features, the Safety Glide Guard serves to protect during cutoff, ripping, dado, and grooving work to various widths and thicknesses. It is never necessary to remove the guard and thus risk injury.

For extra safety, the unit is equipped with the largest and strongest dual "anti-kick backs" ever used on a saw guard. Among the new design features is an adjustable splitter which conveniently adjusts to clear work when not in use.

Tough, breakproof shields of ¼-in. clear Plexiglas operate separately or together. Sealed ball bearings require no oiling.

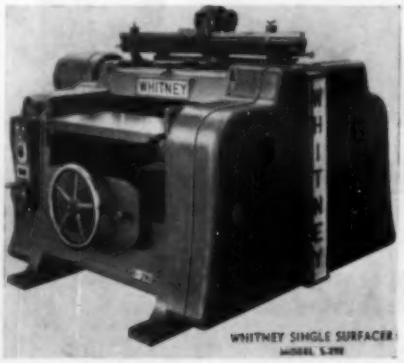
Two models are available, one for commercial use and a lower priced unit designed specially for 6-in. and 8-in. home workshop saws.

Descriptive literature and prices will be sent upon request.

(For Convenience Circle Index Code 0206)

WHITNEY SINGLE SURFACER PLANER

Baxter D. Whitney & Son, Inc., announces the new No. S-290 Single Surface Planer which is built in sizes 36 in., 40 in., and 44 in. wide for planing lumber 8 in. thick.



Whitney Single Surfacer Planer

The Whitney No. S-290 is of the latest design and is equipped with 4-knife cutterhead, variable feed drive, and motorized power hoist for the bed which is of the wedge type construction.

Additional features which are available for the Whitney No. S-290 are simultaneous micrometer adjustment for bottom feed rolls, centralized adjustment of pressure bar, centralized adjustment for top outfeed roll, automatic grinder, and one-shot oil lubrication. This new machine was designed by Whitney engineers, under the direction of Elliott D. May, chief engineer.

Further information is available upon request.

(For Convenience Circle Index Code 0207)

DREMEL MOTO-JIG SAWS AND PATTERNS

The Dremel Manufacturing Company has developed two Moto Jig Saws — one that cuts to the center of a 30-in. circle, and the other to the center of a 16-in. circle.

They are equipped with powerful rotary motors, not vibrators. The larger one is rugged enough to saw through a 2 by 4.

The firm also ditsributes the Dremel Moto-Jig Saw Patterns of which there are eight packets ready at the present time.

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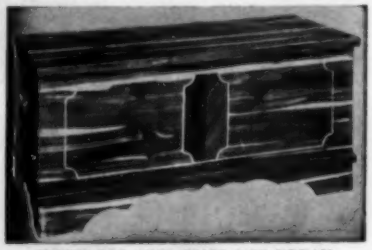
and Aromatic Red Cedar Lumber



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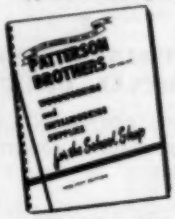

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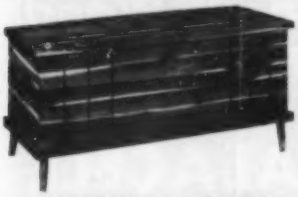

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SHOP EQUIPMENT NEWS

(Continued from previous page)

DeWalt "Power Shop" Demonstration

machine has been heard in the bustling Grand Central Railway terminal in New York City. The display is sponsored by American Machine & Foundry Company, DeWalt's parent firm, as a part of the Merrill Lynch, Pierce, Fenner & Beane Investment Information Center. In addition to the featured attraction of the "live" power tool demonstration, other portions of the AMF exhibit explain the company's growth and diversification over the past ten years. The display, which opened during the first week in November, continued through the month of December. It attracted visitors at the rate of six thousand per day, as counted by an automatic electric-eye computer installed at the entrance.

(For Convenience Circle Index Code 0210)

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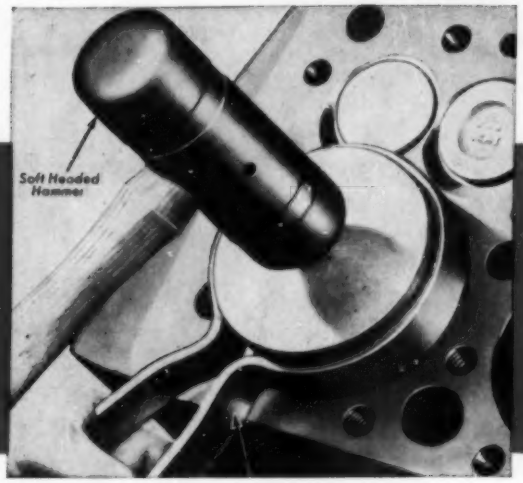

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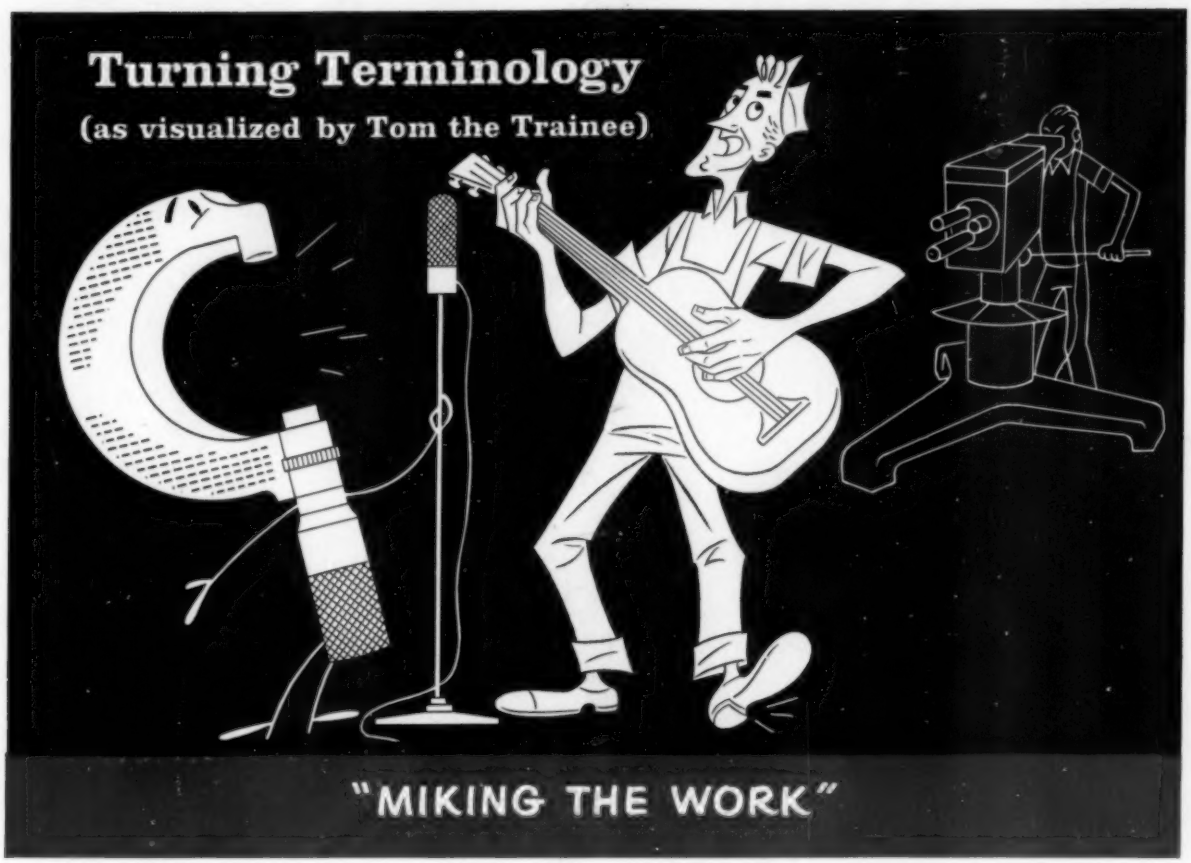

Tom will get plenty of practice reading the thousandths scale on his micrometer when you put him to work on a LeBlond Regal lathe. He'll get used to turning out jobs that call for big-lathe precision, appreciate the way Regals work to close tolerances. That's what makes LeBlond Regals a natural in the classroom — and in thousands of machine shops from coast to coast. They give a long life of precision you'd expect from a much higher-priced machine.

What makes precision? Basically, rigidity of the work and rigidity of the tool. The new Regal headstock design incorporates a big-lathe spindle supported by three bearings, two Timken and one ball bearing. The new tailstock is extra rigid, gives you positive spindle clamping. So, work turns true, even when you're taking a big bite!

The tool is held rigidly, too, thanks to the full 18¾" carriage length on the ways, and the double-wall single-piece apron casting that protects clutch and gear train from dirt and misalignment. Finally, a scientifically designed bed that gives all these elements maximum support. The bedways are hardened and ground, are fitted to the compensating veeway principle that gives a better distribution of forces for long-time accuracy and minimum wear. The same principle we incorporate in the biggest lathes we build!

As a result, you get rigidity and precision that last and last — even when inexperienced hands put them to the test. That's the comfort of having a shop full of LeBlond Regals. Get all the facts today. Call your nearby LeBlond Distributor or write.

The R. K. LeBlond Machine Tool Company

Cincinnati 8, Ohio
World's Largest Builder of a Complete Line of Lathes for More than 69 Years

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